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GASTRO-DUODENAL HEMORRHAGE.*

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The treatment of gastro-duodenal hemorrhage is always an interesting problem, first because of the diverse pathologic processes which may be the cause of hemorrhage, and secondly, because of the fact that satisfactory results in the treatment of these cases depend entirely upon a correct diagnosis and the proper management of the disease which is responsible for the bleeding. For this reason, it is obvious that the surgeon should be on his guard never to make too hasty a diagnosis. The case should be carefully studied and the patient closely observed for a period of time before deciding definitely upon any plan of treatment other than for hemorrhage *per se*.

Although gastro-duodenal hemorrhage is always significant, whether there be a slow oozing which is discovered only by examination of the stools for occult blood or a sudden massive hemorrhage, there is seldom any justification for immediate surgical intervention. The physician in charge should bear in mind the fact that death seldom results from a single gastric or duodenal hemorrhage. Smithies states that about 2 per cent of the sudden massive gastric hemorrhages become rapidly fatal. However, the risk of an operation during or immediately following such a hemorrhage is much higher. This point was emphasized particularly by Rodman who contended first, that the patient is in no condition for operation, secondly, that the emergency of the situation does not permit time for careful differential diagnosis, and thirdly, that recovery is usual after a single hemorrhage. Furthermore, according to Balfour the experience of most surgeons in this country has been that the bleeding point, though hemorrhage may occur from a vessel of considerable size, is often extremely difficult or impossible to find even after the stomach or duodenum has been opened. In this event the patient may be subjected to a lengthy and sometimes futile exploration at a time when the surgeon can ill afford to take the risk.

The most common signs of massive hemorrhage from the stomach or duodenum are, in addition to shock, melena and haematemesis. One must remember, however, that in rare instances the hemorrhage may be fatal without causing haematemesis. Furhermore, haematemesis does not necessarily mean actual gastric or duodenal hemorrhage. It is by no means uncommon for a patient to vomit blood which has been swallowed following hemorrhage from the mouth, nose, pharynx or lungs. Particularly is this true in accident work where haematemesis may be very misleading unless the surgeon constantly bears in mind such possibilities. Having ruled out an extra gastric source of hemorrhage, the immediate problem becomes the determination of the type and location of the pathological process which is responsible for the bleeding. It is a well recognized fact that the causative factors in gastro-duodenal hemorrhage may be actual lesions of the stomach or duodenum, general systemic disorders or disease of some remote organ, as the liver, pancreas, spleen or appendix.

The most common lesions of the stomach or duodenum which may produce hemorrhage are, in order of their frequency, duodenal ulcer, gastric ulcer, duodenitis or gastritis, carcinoma and benign tumors. Syphilis of the stomach may be the cause of hemorrhage but it is questionable whether or not gastric hemorrhage attributed to syphilis of the stomach is due in most instances to an actual syphilitic lesion of the stomach or to secondary changes produced by syphilis in other organs, especially the liver.

After careful observation, if there is no evidence of disease in the stomach or duodenum, the following conditions should be suspected as possible causes for hemorrhage; cirrhosis of

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the liver, gall-bladder disease, jaundice, appendicitis, splenic anemia, purpura, acute infectious diseases, vicarious menstruation, and various types of focal infection. Rosenblum and Gasul have recently reported a case of fatal bleeding from a gastric erosion complicating lobar pneumonia.

When the physician is called to see a patient with gastric or duodenal hemorrhage, the first thing to be considered is the treatment of hemorrhage. If the bleeding is of a slow chronic type, gastro-intestinal studies may be begun immediately. On the other hand, if a massive hemorrhage has occurred, the patient should be put to bed at once, preferably in the hospital, and morphine sulphate administered hypodermically in sufficient quantities to keep the patient quiet. Fluids should be administered by proctoclysis or hypodermoclysis and the stomach kept at rest as nearly as possible. Under such treatment the patient will continue to bleed until the blood pressure reaches a very low level, at which time the bleeding will cease in the great majority of cases.

It is generally considered unwise to give these patients transfusions during or immediately following acute hemorrhage because of the fact that theoretically an elevation in blood pressure will cause the bleeding to continue or, in recently checked hemorrhages, may be responsible for the blowing out of a poorly formed thrombus and secondary hemorrhage. Nevertheless there are rare instances when, in spite of conservative treatment, the bleeding cannot be checked, or a second massive hemorrhage occurs within a few days of the first. In such cases operative treatment becomes imminent and transfusions should be employed as a pre-operative measure. In the case of chronic gastro-duodenal bleeding, the resistance of the patient may sometimes be appreciably increased during the period of observation by the administration of repeated small transfusions. This applies particularly to benign tumors of the stomach and splenic anemia.

A single gastro-duodenal hemorrhage without symptoms or positive roentgenologic findings is never, except under conditions mentioned above, a just indication for surgical treatment. It is a common thing to find a patient who has years previously experienced a massive hemorrhage of unknown cause, but has since then enjoyed good health with no further evidence of bleeding. All cases, however, regardless of symptoms, are deserving of a thorough clinical study. Occasionally the lesion is revealed only by roentgenologic investigation, as a small but definite percentage are due to bleeding ulcer of the silent type. Balfour states that 8 per cent of 1,072 cases of duodenal ulcers operated upon at the Mayo Clinic were without symptoms. X-ray examination, though definitely indicated in certain cases, should be practiced with great care and should never be employed until two or three weeks after all signs of bleeding have disappeared. Smithies says "Every year it has been my misfortune to observe individuals who have experienced acute gastric hemorrhage and upon whom, even while bleeding persisted, the X-ray method of investigation has been employed. In many of these patients heavy barium mixture has not only prolonged hemorrhage and made it more severe, but in numerous instances the consequences have been fatal on account of resultant perforation."

In the study of all cases of obscure gastro-duodenal bleeding one should search diligently for any possible focus of infection. According to Balfour, Eusterman claims to have seen several cases where hemorrhage occurred following operative treatment and the patients were cured by the removal of abscessed teeth. Where time is an important factor and the surgeon finds it necessary to operate before all foci of infection can be eradicated, it is equally as important that this matter be attended to as soon as the patient has recovered from operation. Removal of teeth or tonsils or clearing up of chronic prostatitis will often prevent recurrence of hemorrhage.

As regards the indication for surgical treatment of gastric or duodenal hemorrhage, there is a difference among men of wide experience, Yet there are certain conditions under which exploration is clearly indicated. As we have mentioned above, the occurrence of a second massive hemorrhage within a few days of the first necessitates immediate operation. In fact repeated hemorrhages from the stomach or duodenum, whether large or small, are indications for surgical treatment.

Occasionally where the patient is of the obese type carrying an age around forty to fifty or above, it is difficult to decide upon an operation if there is no history of ulcer, because changes in the liver may be responsi-

ble for the hemorrhage. This is particularly true in male patients.

There is little or no argument regarding the indication for surgery where it is possible to make a positive diagnosis of gastric or duodenal ulcer of the hemorrhagic type. An operation should be advised wherever in the presence of hemorrhage there is a history of dyspepsia suggestive of ulcer, or where a roentgenologic diagnosis of ulcer is made even in absence of a positive history. The risk entailed in the surgical treatment of these cases is less than that of carrying the ulcer, as once bleeding has occurred from a gastric or duodenal ulcer the patient is constantly in danger of a massive hemorrhage. On exploration a thorough examination of the stomach and duodenum should be made. If no lesion can be demonstrated by palpation, it is advisable to open the stomach at the pyloric end, extend the incision into the duodenum and inspect the posterior wall under direct vision. Where such a procedure is carried out routinely it is surprising to note how frequently lesions will be found which cannot be demonstrated by the roentgenologist. When no lesion is found, in spite of a positive history, the probability is that an ulcer has been overlooked, especially in the absence of extra-gastric pathology which may account for the bleeding.

According to Balfour, gross hemorrhage occurred in about 18 per cent of duodenal ulcers and in about 20 per cent of the gastric ulcers which were operated upon at the Mayo Clinic in 1921 and 1922. From eighty-four cases operated upon in Norfolk at St. Vincent's hospital in the past five years. twenty-two cases or 26 per cent were complicated by hemorrhage. Of these ten were gastric and twelve duodenal.

When duodenal ulcer is found on exploration, the question of deciding between a direct and an indirect operation immediately arises. If the lesion is found on the anterior wall, the duodenum is freely movable and the inflammatory process is not too extensive, a local excision of the ulcer and pyloroplasty, with the removal of a portion of the pyloric sphincter is unquestionably the operation of choice. Such a procedure not only gives the greatest protection against future hemorrhage from the known ulcer but enables the surgeon to examine the posterior wall of the duodenum for the so-called kissing ulcer which, if found, may be removed by the actual cautery and the defect in the mucous membrane closed by a figure of eight suture of chromic catgut. In reconstructing the pylorus, the defect in the anterior wall should be closed in the transverse direction, thereby insuring a sufficiently large pyloric opening.

It is interesting to note that in 1919 Balfour reported that 13 per cent of the patients operated upon for duodenal ulcer complicated by hemorrhage had hemorrhage after operation, but that not in a single instance had the ulcer been excised. However, in the heat of enthusiasm one should not forget the fact that an indirect operation offers a good chance of relief; and that an easily performed gastro-jejunostomy carries much less risk than a technically difficult excision and gastro-duodenostomy. For this reason it is often the wiser procedure. When gastro-enterostomy is performed, a posterior anastomosis is preferable to an anterior, but in cases where the omentum is fat, or the posterior wall of the stomach is bound down by adhesions an anterior gastro-enterostomy may be very useful. The proximal loop should be long enough to swing freely over the omentum and a side to side anastomosis made between the most dependent part of proximal loop and the distal loop in order to prevent damming back of secretions into the duodenum. Where gastro-enterostomy is employed, it is often wise to puncture the base of the ulcer with the cautery and close the opening with chromic catgut.

When exploration fails to reveal a lesion of the stomach or duodenum, in spite of the fact that pre-operative signs point to ulcer, a reconstruction operation on the pylorus may protect the patient against future hemorrhage. Particularly is this true when no other lesion is found which might have accounted for the bleeding or where the duodenal mucosa is red and congested. If on the other hand pathology is found elsewhere in the abdomen (cholecystitis, appendicitis, or splenomegaly in particular) eradication of such foci may offer complete relief.

Gastric ulcer, regardless of hemorrhage, is an indication for surgery, because of the possibility that the lesion may be malignant. Only when the general health of the patient is such that surgery is almost prohibitive should any question arise. The condition of the patient, the size and location of the lesion should all be considered in deciding what procedure is to be carried out. If the patient's

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general condition permits, the lesion is accessible and the stomach easily mobilized, partial gastrectomy is the operation of choice. It not only removes the source of hemorrhage, but offers an added precaution against recurrence in case the lesion proves to be malignant. A less formidable procedure which may be employed where resection seems inadvisable is local excision by knife or cautery and closure of the defect with chromic catgut sutures. Occasionally, when the lesion is situated in the cardiac end of the stomach, the surgeon must resort to gastro-enterostomy which sometimes gives very satisfactory results, but offers less protection than gastrectomy or local excision. Finally, in well selected cases where the lesion is large and situated high in the fundus of the stomach, jejunostomy for feeding purposes may be employed and the stomach put at absolute rest. I have seen several cases treated in this way, where after three to six months, symptoms had subsided and the lesion could not be detected by roentgenologic examination.

Hemorrhage as a complication of carcinoma of the stomach is of minor interest. Gross hemorrhage seldom occurs, and the treatment resolves itself into treatment of carcinoma of the stomach, with one exception. It is occasionally worth while to remove a lesion as a palliative measure where the prospects of permanent cure are hopeless, in order to relieve the patient of the disagreeable and distressing complication of hemorrhage.

Benign tumors of the stomach may cause severe secondary anemia by continuous oozing over a long period of time. They are, unfortunately, often overlooked unless diagnosed by fluoroscopic examination. For this reason one should not fail to keep in mind the possibility of such a lesion where exploration is carried out for unexplained gastro-intestinal bleeding with secondary anemia. The removal of a benign tumor is rarely difficult and the results are practically always satisfactory.

The results of splenectomy in cases of splenic anemia complicated by hemorrhage are less striking than one is often led to believe. T. Grier Miller has recently emphasized this fact and reported four definite cases of splenic anemia from his clinic at the University of Pennsylvania, in which hemorrhages have occurred following splenectomy. He advances the theory that the dilatation and congestion of the veins of the stomach in these cases is due to an active congestion rather than to a passive. His argument is that the essential lesion of the spleen in splenic anemia is sclerotic, leading to obstruction of the circulation through the spleen and, in consequence, to shunting of an increased amount of arterial blood into the gastric vessels. The increased blood supply to the stomach is probably sufficient to account for the varices found in the stomach, lower esophagus and gastric omentum. Under such circumstances transient increases in blood pressure or direct trauma may produce rupture of a vein and profuse gastric hemorrhage.

On the basis of this theory Dr. Miller suggests that in performing splenectomy for splenic anemia associated with gastric hemorrhages, the splenic artery be ligated proximal to its gastric branches. Whether or not this point in technique will materially decrease the percentage of failures in checking gastric hemorrhage by splenectomy remains to be proven, but certainly his line of reasoning seems logical and is in our opinion worthy of trial.

Conclusions

1. Gastric or duodenal hemorrhage is seldom, except under rare conditions, an indication for immediate surgery.

2. There are a great variety of pathological lesions, both intra-gastric and extra-gastric which may be responsible for gastric or duodenal bleeding.

3. Success in the management of these cases depends entirely upon correct diagnosis and proper treatment of the disease responsible for hemorrhage.

4. Roentgenologic examination, while necessary in a small percentage of cases, should be carried out with extreme care and should never be employed until three to four weeks after bleeding has ceased.

5. Transfusion is usually contraindicated during or immediately following gross gastric or duodenal hemorrhage except as a pre-operative measure in extreme cases where the surgeon is forced to operate because of repeated hemorrhage.

6. A single gross hemorrhage without symptoms is not an indication for surgical treatment.

7. Repeated gastric or duodenal hemorrhage is in most cases a surgical indication.

8. Hemorrhage associated with the symptoms or roentgenologic findings of gastric or duodenal ulcer should be treated surigcally.

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9. No single operation is the procedure of choice in the treatment of all bleeding gastric or duodenal ulcers.

10. Benign tumors of the stomach may be the cause of severe secondary anemia. They seldom produce gross hemorrhage. Such lesions should always be removed surgically.

11. When splenic anemia is the cause of gastric hemorrhage, splenectomy offers the greatest chance of relief. Ligation of the splenic artery above the gastric branches may, as suggested by Miller, reduce the percentage of poor results following this operation.

12. All possible foci of infection should be eradicated as a pre-operative or post-operative precaution in the treatment of gastric or duodenal hemorrhage.

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THE SUBJECTIVE FACTOR IN THE PROGNOSIS OF PULMONARY TUBERCULOSIS.*

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We have reached a fair degree of accuracy in determining the possibility of recovery and repair offered by an individual case of pulmonary tuberculosis. The objective clinical data presented can be fitted in with parallels derived from experience with other cases, so that, after allowing for individual variations in the production and maintenance of specific immunity, we know quite definitely to what extent we may look for recovery from the active disease present, and a restoration to a working status. Such a forecast is, of course, predicated upon the condition that the required therapeutic management be instituted promptly, carried out effectively, and continued long enough.

When we compare possible recoveries, based on such objective data as those described, with the actual results, as shown by a retrospective analysis of case records, we find a marked discrepancy. The question immediately arises, on what does this discrepancy depend?

In my own experience, the failure to obtain the results that we have a right to expect from the clinical findings, when the patients first comes for relief, is most often due to the failure of the patient to carry out and complete the treatment recommended. Such failure is due either to the inability, or to the unwillingness of the patient to do what is necessary, or to keep on doing it long enough. As between these two reasons, I find that the economic factor has less to do with unsuccessful treatment than have character and temperament.

Poor patients, who do the best they can, get better results than the well-to-do who fail to cooperate. There are few communities now-a-days that do not furnish hospital or sanatorium care for indigent cases of pulmonary tuberculosis that offer a prospect of arrest or cure. In cases that are better off, but still too poor to seek institutional treatment in a more desirable climate, very remarkable results have often been obtained by attacking the problem of treatment in the home. The factors that hinder the curable cases of tuberculosis from being cured are more often not poverty, but certain conditions that are associated with the patient. They are either intrinsic, or circumstantial. They appear to lend themselves to classification as follows:

1. Lack of Back-Bone.
2. Self-Conceit.
3. Misapprehension of the Meaning of Cure.
4. Outside Influences.

1. *Lack of Back-Bone.* It is trite, but necessary to say that getting well of tuberculosis requires courage, patience and determination on the part of the patient. Discomfort and distress must be bravely endured. Discouraging incidents must not induce despair. In no situation does character make such returns. We almost come to feel that such character is a physiological function that goes hand in hand with resistance to disease.

2. *Self-Conceit.* We know the old saying that a man is a fool who is his own doctor.

*Read before the Piedmont Medical Society, at Louisa, Va., June 3, 1931.

In no condition does this come nearer to being true than in this disease. There is a type of human being whose knowledge is so superficial, that he regards himself as able to make wise decisions on all subjects. "The way of a fool is wise in his own eyes." We may look out for the patient who, as soon as we have outlined for him his malady and what is necessary for him to do to be cured, begins to ask whether he can do this, or whether it would not be just as well for him to do that. He does not want his inclinations interfered with, and devises judgments that are agreeable to him. We frequently run across such cases in advanced stages, who have been everywhere, consulted everybody, and who have never taken any advice long enough to be benefited. Unless they can be jolted out of their folly at the outset, their fate is inevitable. They keep on the go until they are permanently bed-ridden. Before they die, they often bitterly criticize every one and every place they have visited.

3. *Misapprehension as to Cure.* When a person who has for one or more years been below par, always tired, underweight, dyspeptic, with cough, fever and sweats, finds that he has put on twenty or thirty pounds after taking a cure for six months or more, and has a ravenous appetite with perfect digestion, is free from cough, and can walk three or four miles, coming in feeling like a wrestler; when his physician, who has been his friend and guide through the cure, examines him, and tells him that there are no signs of active disease to be found in his lungs, the impulse of such a person to regard himself as well, and his disease a thing of the past, is apt to be overpowering. Unless he has been very thoroughly taught the pathological behavior of focal tuberculosis, its liability to recur, and the importance of maintaining over a long period of hygiene of life designed to prevent such recurrence, he is very likely, especially after passing from under the eye of the physician who directed his cure, to take up active life too soon and too abruptly. The most tragic cases belong to this group, because they throw away their chance of health, when it is almost in their hands.

4. *Outside Influence.* This factor enters into almost all cases that recur after having started in the right direction. Sometimes in the family, sometimes from outside comes the unsolicited advice of would-be helpers. The patient has not got tuberculosis; or, if he did have it, he is over it; it is silly to talk about any one being sick who looks better than he ever did before; he is hypped, and only needs to get out and act like other people; to forget about it. Such interference, when coming from outsiders, is bad enough; but when it comes from within the family, it may make life intolerable for the patient, or even deprive him of the facilities required for taking the cure. I shall cite cases illustrative of the text.

I. An ambitious young architect of thirty, married, having one child, and doing well in his profession. Has always regarded himself as having rugged health, and did not spare himself, working long hours. He is found to have pulmonary tuberculosis. Is advised to go to Saranac Lake. Refused to take this advice. He went to the Virginia hills, and took rest and fresh air treatment there under my direction, coming to see me from time to time, and corresponding in between. In a year he had gotten a complete arrest, gained thirty pounds, and physical findings and clinical signs of disease were absent. He then, directly against my advice, returned to his home outside of New York, claiming that he could get gradually back into harness and continue treatment there. He got exercise by working in his garden. One day he used intense effort trying to dig up a stump, and "got over-heated," "caught cold," he said. He entered a relapse of his lung disease. He was a suffering invalid till his death, which occurred three years later. He could not be convinced that he was not a well man.

II. A young woman, aged twenty-five, a stenographer in a Government office, developed a very active tuberculous lesion of the lung in January, 1920. She had recently married a young man who had been a patient of mine, and it was through him that I was engaged to care for the case. She was put to bed in a well ventilated room. In two months she had markedly improved. Fever, cough and bacilli in the sputum had disappeared, and later the physical signs of activity were absent. About this time her husband lost his job at the Navy Yard through a curtailment of personnel, which followed the War. In order to continue the treatment, it became necessary for her to go to live with her mother. The mother had never had any use for her daughter's husband, and this antipathy went to the degree of disagreeing with the diagnosis of the physician employed by him. She stopped her visits to me. The mother insisted that her daughter had nothing the matter with her, and that she

should go to work. Unable to stand the continual nagging to which she was subjected, the young woman returned to her job in October. Symptoms of relapse appeared in December, and she died the following July, eighteen months from the time the disease was first recognized. I was called to attend her in the last weeks of her life, and learned the story during this period.

Such cases could be multiplied indefinitely, but these serve the purpose of illustrating how the factors I have mentioned work in actual cases.

The practical question for us as physicians is to ascertain what can be done to equalize this discrepancy between potential and actual cures of consumption of the lungs; to make the science and art of medicine march more nearly abreast. As the causes of the discrepancy lie in the patient's subjective make-up, the remedy lies in ascertaining what the handicapping factors are for each individual patient, and trying to mitigate or remove them.

Where there is lack of courage and patience, there is little hope. Nevertheless, the cure is not so arduous in all cases, and some weaklings stand the vegetative existence of the rest cure exceedingly well. It is important to remember that some natures are essentially parasitic, and will get along well enough if they have some one on whom to lean. A strong mother, wife, or even a husband has saved the life of such a one. It is important to determine the make-up of a tuberculous patient before deciding how to manage his case. To send a weakling off alone to a sanatorium, to face the loneliness, the nostalgia, the monotony of a long endurance test, is something like prescribing a carefully estimated diet of 1300 calories for a typhoid patient who refuses all food.

Of the self-conceited patient, the less said the better. "Fools die for want of wisdom." (Proverbs x, 21). "The way of a fool is right in his own eyes." (Id. xii, 15). "Speak not in the ears of a fool." (Id. xxiii, 9). "Seest thou a man that is wise in his own eyes There is more hope of a fool than of him." (Id. xxvi, 12). Indeed, Solomon might well have been running a tuberculosis clinic before he sat down to write his proverbs.

Of the patient who thinks he is cured; who goes back too soon to work at his old pace, and relapses? It is here that the attending physician has his greatest opportunity, and hence, his greatest responsibility. And I fear that it is in this situation that we most frequently fall short.

Truth is a great force. It never comes back to plague us, when we have practiced it. We are all tempted, when we have to inform a patient of a grave matter, to try to soften the facts by indefinite terms, by euphemisms, by speaking as though the matter were not so serious after all. The first impressions made upon a patient, when he faces for the first time the discovery that he has the disease, are of paramount importance. I have become convinced that the whole brutal truth should be communicated at the outset. It is rough at first, but it is kinder in the long run. If, after he has faced the initial jolt, he finds new items of bad news cropping up later, he feels that he is being kept in the dark; that he can't build on anything; and the effect on his morale is evil. If, on the other hand, he finds that things are no worse, not even so bad as he had expected, as he makes his necessary adaptations, his morale is correspondingly improved, and his confidence in his physician increased. This latter feature is important for him, as the doctor's power to help him is increased thereby. I have come to use a regular formula in replying to the patient's first question of how long it is going to take him to get well, namely—"A year for the cure, and two more years to clinch it—possibly longer."

It is necessary for the physician to have the cooperation of the patient, both in conduct and in morale. This cooperation is inevitably impaired, if the patient gets the idea that he has been deceived. When he finds, as he goes along, that the outlook becomes brighter, rather than more gloomy, even though he reflects that his physician has been over-pessimistic, his confidence is not impaired. Contentment makes him charitable; and *vice versa*.

It is very important that the patient be instructed in the natural history of his disease; in the manner in which healing is acomplished; in how recurrences are brought about. We should not assume that patients cannot be made to understand about this. I have never had reason to change an attitude adopted early in my professional life, namely, that every responsible patient is capable of understanding what it is necessary for him to know about his disease, that we have no right to ask of him intelligent cooperation, unless he has such knowledge; and that if we practice it, we can acquire the art of imparting such knowledge.

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We may have to speak in parables, but it can be put over. It is here that I believe we fall short of our power to help more than anywhere else.

The outsider, the "butter-in" is a pest that we nearly always have to reckon with. If we see our patients regularly, and often enough: if they have been trained to consult before making the least change in their daily regime; if they make of each visit a confessional of everything that concerns them, we will be able to protect them to some extent. Generally they have to learn by being punished for indiscretions. Lucky are they if such punishment is not disastrous. Practically every patient treated at home has to suffer more or less from officious kinsfolk or friends. In tuberculosis it is not true that "in a multitude of counsellors there is safety." It is an occasion for martial law, not for democratic rule.

I wish to offer my tribute to that great center for the treatment of tuberculosis, Saranac Lake. It surpasses all other places,—not because of its climate, which is bad during the spring months, and in winter unsuited for asthenic patients; not on account of its medical personnel, for, admirable as that is, men just as able, just as idealistic, are found elsewhere; but on account of the morale of the place as a whole. In other resorts, the lungers are dumped down alongside a healthy population. In Saranac nearly the whole population is made up of lungers, or ex-lungers. Curing tuberculosis, and keeping it cured, is the business of the place. It is in the air. The patient gets a post-graduate instruction in individual hygiene, as applied to his disease, that is not to be obtained anywhere else that I know of. It partakes of the nature of a religious conversion. It is something for us to aim at in guiding our arrested cases, even though we know we must fall short.

A DISCUSSION OF SOME IMPORTANT FACTORS CONCERNING THE EIGHTH NERVE.*

By HARRY R. SLACK, Jr., Baltimore, Md.

This is rather a broad subject, and we shall not attempt in anyway to cover the entire field, but it gives an opportunity to draw your attention to some of the vital points in the matter of diagnosis. The treatment we shall not take up at all. Two or three interesting cases encountered recently emphasize the necessity for constant vigilance in connection with information furnished us by the eighth nerve. After discussing these briefly, I shall show some lantern slides, which, I think, will prove of interest to this group.

The first case is that of a woman, 33 years of age, coming in because of tinnitus, and slight deafness in the right ear. There was no history of any ear trouble in early life, and no important factor in the case, other than the fact that the patient had some headache of increasing frequency and severity during the three or four weeks immediately preceding her first visit. The examination as regards the nose, throat and sinuses was absolutely negative. Both ear drums were perfectly normal in appearance, but the hearing on the right was definitely impaired for both air and bone conduction. Impairment for bone conduction was more marked. Weber's test was referred to the left. Both eustachian tubes were patent and easily inflated. There was no spontaneous nystagmus or past pointing error. On irrigating the right ear with cold water, it was discovered that the vestibular reaction was very markedly impaired. On the left it was perfectly normal. Examination of the eye grounds showed an unmistakable early choked disk on the right side. The patient was given a very thorough general medical work up, with completely negative results—Wassermann, blood chemistry and so forth. She was referred to Dr. Dandy with the suggestion that there was a probable lesion of the cerebellar pontine angle. After careful examination and a week's observation, he did an exploratory craniotomy and found a very definite acoustic nerve tumor, the smallest he had ever seen. The chief factors about this case are—the tinnitus, unilateral deafness, which was a nerve deafness in type, and the absence of vestibular response on the right side.

There are so many conditions that may produce symptoms involving the eighth nerve that we are sometimes prone not to give the matter as broad a consideration as it deserves. Dizziness and vertigo are so common in neurasthenic patients that they are very frequently passed up as of no importance.

I think probably one of the most frequently overlooked central nervous lesions in this field is syphilis. So often we will discover accidentally a slight nerve deafness, and unless the case is followed up, and vestibular tests,

*Read before the Virginia Society of Oto-Laryngology and Ophthalmology, at Richmond, May 2, 1931.

Wassermann and spinal puncture done, the diagnosis may be entirely missed.

Another case which illustrates some of the difficulties recently came under our observation—a man, 58 years of age, with a history of extreme dizziness increasing in severity over a period of eight years. He had no headache, although occasional disturbances in vision, but no symptoms referable to the sinuses or throat. I shall omit a detailed account of the examination, but simply give the results of his ear investigation. There was a slight spontaneous nystagmus to the left, very slight spontaneous pointing error to the left, but this was constant. Hearing perfectly normal in the right ear, impaired in the left ear, especially for the high tones, and the bone conduction was much more impaired than the air conduction. Irrigation of the right ear with cold water for eight seconds produced a rather marked response, nystagmus and pointing error. Irrigation of the left ear four seconds produced a very violent response. On turning the patient and stimulating the right semicircular canal, five turns produced above the average response. Stimulating the left, three turns produced a very violent response. Our conclusion was that the patient had a very definite irritative lesion involving both eighth nerves, but especially the left. The medical diagnosis was, finally, multivascular lesions in various parts of the brain. Of course, the prognosis was very poor.

Some of the simpler conditions that are at times rather important are foreign bodies in the auditory canal, such as inspissated hairs and desquamated epithelium, which give rise to coughing. I have seen three cases, supposed to have had tuberculosis, that were entirely cured by removal of impacted wax; and several attacks of vertigo have been relieved by removing two or three hairs from the drum.

Before going to the lantern slides, I wish to bring to your attention the League for the Hard of Hearing. I feel that we ought to in every way possible cooperate with the practical side of readjusting the deaf. I understand you have an organization of the League here in Richmond, in the Basement of the Y. M. C. A. Building, and there is a very extensive National Organization that accomplishes untold good in providing re-education and re-adjustment.

(Showed a number of lantern slides at this point).

I should like to give you a brief summary of the work which is being done in the otological laboratory at the Johns Hopkins University. This work has been done by Drs. Crowe, Guild, Hughson and Polvogt. In the first place, a great deal of pathological material has been accumulated during the last five years, and, thanks to the persistent interest of Dr. Guild, excellent sections of the temporal bone have been secured. A great many of these cases have had accurate audiograms made at various times before death. It is now a problem to correlate the pathological lesion with the picture of the hearing.

One of the most important factors coming of this particular phase seems to be a direct relation between the number of nerve fibres which enter the various turns of the cochlea and the acuity of hearing. A great many sections have been counted, and Dr. Polvogt has reported this work. Also, a very definite lesion for otosclerosis has been found.

On the experimental side in the Hunterian Laboratory, Dr. Crowe and Dr. Hughson are just finishing some very interesting observations on the cat. They exposed the oval window and opened the middle ear so that the entire contents can be seen and controlled. By means of platinum electrodes, one of which is placed somewhere in the distribution of the eighth nerve and one in any other place in the brain, sound can be transmitted to a distant room through a very powerful amplifier. From their observations, it is evident that sound produces some electrical change in the eighth nerve region.

The most conclusive evidence that it is a vital force, and not simply a chemical or physical reaction, is the fact that the minute the animal dies all transmission ceases entirely. It seems that the entire concept of the hearing and sound will have to be revised.

1100 *North Charles Street.*

AVERTIN ANAESTHESIA IN OTOLARYNGOLOGY.*

By FLETCHER D. WOODWARD, M. D., F. A. C. S.,
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The fear in the patient and sometimes actual pain during the surgical procedures of the otolaryngologist has often been justified be-

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cause of the uncertain methods of producing anaesthesia. However, it is not the purpose of this paper to condemn any type of anaesthesia, but rather to present a brief summary of the literature, combined with our experiences with the new rectal anaesthetic commercially known as avertin, or E-107, and chemically labelled as tribrom-ethyl alcohol.

Local anaesthesia, i. e., topical, infiltration and block is indispensable to the rhinologist in some of his work, though its extensive use is probably due to its margin of safety and simplicity of administration.

Anaesthesia by the inhalation method has a definite place, but its use is somewhat limited in our field of work. In operations about the face, the field is at best restricted and, when an inhalation anaesthetic is to be given, the gas mask or ether cone and the anaesthetist practically crowd the surgeon out. Gases irritate the mucosa, causing excessive secretion and vascularity. The inflammable properties of most of the inhaled anaesthetics prevent their use if a cautery is to be employed. Inhaled anaesthetics are certainly not the anaesthetics of choice in inflammatory conditions of the respiratory tract as is often the case with our patients.

The first attempt at rectal anaesthesia was made in 1846 by Roux, with an aqueous solution of ether. In 1847 Pirogoff tried ether vapor; however, neither method was successful.

In 1913, Gwathmey's ether-in-oil anaesthesia, with or without the supplementation of the hypodermic of magnesium sulphate, had its ardent supporters, but has never been entirely satisfactory. This preparation frequently caused irritation of the rectal mucosa, with tenesmus, diarrhea, and ulcerations.

The few above enumerated facts combined with the fear and anxiety in the patient, of the anaesthetic and operation, has made us very eager for a more ideal anaesthesia.

During the year 1923 Willstatter and Duisberg produced tribrom-ethyl alchol (avertin) by the action of yeast on bromal. A short time thereafter Eicholtz demonstrated its pharmacological properties. The first clinical application was demonstrated by Butzengeiger in March, 1926. In 1928, Dr. J. C. Beck performed the first surgical operation under this anaesthetic on this continent. Following the initial clinical application of tribrom-ethyl alcohol as a rectal anaesthetic, numerous experimental and practical applications were carried out, both rectally and intravenously. The latter has been discarded entirely and it is only used as a rectal anaesthetic.

Avertin is a non-inflammable, odorless, white crystalline substance, having a melting point of 80° C., and is soluble in water at 37° C. up to 3 per cent. Solution occurs very slowly, requiring approximately forty-five minutes with vigorous shaking to dissolve. Each solution had to be prepared freshly, which offered a great handicap. It is now issued, dissolved in amylene hydrate, 1 gram to 1 c.c., which is readily soluble in water at 37° C., and labelled avertin fluid. In aqueous solution it is decomposed by heating above 45° C. into hydrobromic acid and dibromacetaldehyde; the latter is extremely irritating to the intestinal mucosa and may even cause ulceration. The presence of this undesirable decomposition is detected by adding a few drops of a 1 to 1,000 neutral congo-red solution to a few cubic centimeters of the freshly prepared solution immediately before its administration. The formation of a blue or violet color indicates that decomposition has taken place and the solution must be discarded, but the presence of a clear orange-red color indicates that the solution is free of impurities.

From the above statements, one would conclude that the margin is small for a proper mixture, but decomposition does not take place so readily as supposed. In our work while making the essential pre-administrative congo-red test, the test tube with the solution was placed in a rack for observation. The rack was put in a moderately illuminated spot at room temperature and watched daily for color changes. We observed twenty different solutions and no change in color was noted before ninety hours and many failed to get the purplish hue until eight days had elapsed. The average color change occurred in six and one-half days.

Avertin is absorbed by the intestinal mucosa very readily. Straub found that 80 per cent was absorbed during the first twenty minutes, and that 95 per cent was absorbed during the first two hours. He also states that the drug is more rapidly absorbed than the water in which it is dissolved. According to Sebening, during anaesthesia it is in a concentration of from 6 to 8 mgs. per cent in the blood.

Avertin is detoxicated during its passage through the body by a combination with glycuronic acid and is excreted in the urine as

urobromalic acid. It is excreted almost entirely by the kidneys, but traces have been found in the expired air and perspiration. Straub recovered 81 per cent from the urine of animals during the first forty-eight hours; whereas, Parsons recovered 72 per cent in humans during the same period. Traces of avertin have been found in the urine of animals sixteen days after its administration, but for only six days in humans. He also states that he has recovered from the urine 98 per cent of the total amount given. Therefore, it seems very unlikely that any appreciable amount is eliminated by any channel other than the kidneys.

The lethal dose is about 0.5 grams per kilo body weight; whereas, the anaesthetic dose is in the neighborhood of 0.12 grams per kilo body weight, thus giving a therapeutic index of approximately four.

Avertin resembles chloroform in its action on the heart. However, the effects produced by chloroform in a dilution of 1 in 20,000 are not produced by avertin until a concentration of one in 1,250 is reached, which means that chloroform is about sixteen times as toxic as avertin upon the cardiac musculature. The pulse rate is a little decreased during the anaesthesia, but there is no change in the quality. The systolic blood pressure usually drops from 10 to 30 millimeters of mercury immediately after the patient becomes anaesthetized, and at times the pressure may drop even lower. This initial fall is usually restored simultaneously with the beginning of the operation. One of our cases had a drop in the systolic pressure of 70 millimeters of mercury two hours after the induction of avertin, but his pressure responded nicely to ephedrine given hypodermically. Another case, with hypotension had the systolic pressure to fall so low that we were unable to estimate the pressure. She responded immediately to adrenalin and ephedrine given hypodermically and there was no further lowering of her blood pressure during the anaesthesia.

There are several reported cases in which the blood pressure has dropped 100 millimeters of mercury or more. One case was that of hypothyroidism. Hypothyroid cases do not seem able to detoxicate the drug very rapidly.

The respiration is slower, yet the efficiency is maintained by the increase in tidal excursions. Cyanosis rarely occurs, unless there is obstruction, such as the tongue falling back, due to relaxation. This can be corrected by pulling the chin forward or inserting an airway. We had one case to become cyanotic because of blood running down the nasopharynx during an intra-nasal operation without sufficient post-nasal plugging. His color promptly returned after aspirating the blood. The respiration can be increased by the usual stimulants, such as carbon dioxide and oxygen mixture and caffeine. Parsons claims that the slowing of the respiration is mainly due to a diminution of a voluntary movement and to absence of reflex activity from the respiratory tract, because, after a normal dose of avertin, the respiratory center retains all of its reflex effects and responses to drugs. However, toxic doses caused death by respiratory paralysis.

According to Burger, Bourne, and Dryer, avertin has very little action upon the liver function but produces some temporary kidney depression. No change has been noted in the parenchyma of any of the organs, even though subjected to repeated doses over a period of weeks. Artificial administration of glycuronic acid is of no benefit, since detoxication is a function of the liver parenchyma.

Avertin is recommended as a basal anaesthetic, to be supplemented by a general or local —such as the supplementation with a local application of cocaine and adrenalin or the infiltration about the primary incision with novocaine-adrenalin solution is usually sufficient, and even desirable, as a local hemostatic.

In our series we have obtained surgical anaesthesia in 70 per cent of the cases. Often the patient would be very restless and sometimes become noisy. On three occasions the patient talked during the entire operation, but did not recall any of the conversation or surgical procedures. Another patient began singing ten minutes after the administration of the anaesthetic and continued for about two and a half hours. Noisy or restless post-operative reactions have occurred in 10 per cent of the cases. This is combated by pantopon hypodermically.

The preparation of the patient consists in giving an enema and a mild hypnotic the night before so as to obtain a night's sleep previous to the operation, but this is not essential. A hypodermic of morphine with hyoscine or atropine is usually given thirty minutes before administering the drug, although the hypodermic may be eliminated, as is sometimes desirable, because morphine is a respiratory depressant. We have used the pre-operative

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hypodermic in the majority of our cases, and prefer 1/6 grain of morphine sulphate and 1/150 grain of atropine for adults.

Some advocate giving the avertin in the patient's room; whereas, others claim just as good results when it is given in the operating room. We have given practically all of ours in the operating room, as this enables us to keep in one place all the apparatus necessary for administering the drug. The dose varies from 60 to 150 mgs. per kilo body weight, depending upon the individual. Children, robust individuals and hyperthyroid cases tolerate, or rather require, a larger dose than old dehydrated or obese patients. We have used doses varying from 60 to 110 mgs. per kilo body weight.

The drug is dissolved in distilled water between 35° and 40° C. so as to make a 2½ per cent solution, which is calculated from the dosage table. Just prior to injection, the preparation is tested with the neutral congo-red indicator for impurities. If the temperature is below 35° C., the avertin is precipitated out and is not absorbed. The mixture being free from impurities, it is allowed to flow by gravity into the large bowel by way of a small funnel and tube. We use a No. 18 French catheter. The patient is placed on his left side during the administration of the drug, which requires about three minutes. The buttock is strapped with adhesive to prevent expulsion of the avertin.

Amnesia ensues in three to ten minutes after administration of the drug, but the maximum anaesthesia is not obtained for approximately twenty-five minutes. The maximum effect is retained for from one to one and one-half hours, after which the patient has complete amnesia for four to ten hours, usually around six. The patient must be watched rather carefully during this period to prevent respiratory embarrassment which may be caused by relaxation of the tongue and jaw or smothering in the pillow. He usually awakens and asks for water.

There are very few post-operative complications reported. There seldom follow nausea and vomiting or complications of the bowel. Pneumonia and bronchitis are rare. We have had two patients that required catheterization one time each. Nausea and vomiting were noted in two cases, although both were of a mild degree. In one case a rash occurred on the third day after operation, which simulated a drug rash.

Our series, totaling sixty-five cases, consisted of the following operations, namely:

a. Twelve Radical Maxillaries—Five bilateral and seven unilateral. Three were supplemented with a little ether and three had the primary incision infiltrated with novocaine and adrenalin solution.

b. Four Radical Frontals—Each was supplemented with infiltration at the site of the primary incision with novocaine and adrenalin solution and the nasal mucous membranes shrunk with cocaine and adrenalin.

c. Five Tonsillectomies and Adenoidectomies—One was supplemented with chloroform as a large portion of the drug was expelled soon after injection.

d. Six esophagoscopies—Two for removal of foreign bodies and one for the passage of a bougie through an esophageal stricture which we had previously been unable to permeate. Three were diagnostic.

e. Nine Bronchoscopies—Three had lipiodol injections following examination without any complications. Two were for removal of foreign bodies and the others were diagnostic.

f. Fourteen Mastoidectomies—Seven were supplemented with a very small amount of gas.

g. Fifteen miscellaneous operations about the nose and throat, which consisted of intranasal sinus work, submucous resections, dilatation of laryngeal strictures, etc.

The oldest case was sixty-eight years, and the youngest eleven months.

In our experience we have obtained very gratifying results, particularly in the radical sinus work, bronchoscopies, and esophagoscopies. There is a certain amount of danger associated with tonsillectomies and intra-nasal work because of hemorrhage obstructing respiration; however, the proper precaution of post-nasal plugging and continued aspiration of the blood will practically eliminate this danger.

There are a few contraindications for the use of avertin, namely, severe renal or hepatic involvement; nevertheless, the drug has been used in some cases with marked icterus without untoward results. We have used it on one patient who had only one kidney, without apparent renal damage. Inflammatory and ulcerated conditions of the rectum and colon are definite contraindications. Acidosis is usually listed as a contraindication, but there are many

cases reported of marked diabetes in which avertin has been used successfully. We have used avertin in one such case. In hypothyroid cases a very small dose should be used, as the drug is eliminated slowly from such patients. In hypotensive cases the blood pressure must be watched very carefully. Avertin should never be the anaesthetic of choice for phrenicotomies, as Killian has shown in rabbits that respiration decreased 25 per cent after division of one phrenic nerve and 50 per cent after both were cut. Several other contraindications, such as cachexia, marked blood diseases and tuberculosis were formerly listed, but it is apparently the consensus of opinion of those familiar with avertin that the margin of safety is greater with this drug than any other anaesthetic. It is twice as safe as ether, and five times safer than chloroform or spinal anaesthesia.

Avertin is yet a relatively new anaesthetic, but its practicability has been sufficiently demonstrated to say that it is the anaesthesia of choice in highly nervous individuals, particularly if they have had repeated anaesthetics. It has been used extensively in surgery of the head, face and neck, and is highly recommended in hyperthyroid cases. In the latter cases the elimination is more rapid than usual and the dose must be necessarily increased. There are cases reported in which it has been used in tetanus to prevent convulsions; however, it has no curative power. It has been administered in light doses to patients for demonstrations before large clinics, and to small children before taking X-ray pictures. Unruly mental cases have been quieted with it and drug addicts have been carried through the crucial stage without the administration of any of the drug to which they were addicted.

Conclusions

1. Avertin anaesthesia can be used to a considerable advantage in bronchoscopies, esophagoscopies, and radical sinus work.

2. With a few exceptions, avertin is a suitable anaesthetic in patients with chest conditions which are endangered by inhalation anaesthetics.

3. There have been no manifestations of rectal or colonic complications.

4. Approximately one-third of the cases required an additional anaesthetic.

5. Patients must be watched during the period of amnesia following the operation.

6. Avertin should be used with the idea of supplementing if necessary.

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A STUDY OF THE CIRCULATORY SYSTEM OF 150 ADOLESCENT GIRLS, PARTICIPANTS IN OR CANDIDATES FOR COMPETITIVE ATHLETIC SPORTS.*

By COURSEN BAXTER CONKLIN, A. M., M. D., Washington, D. C.

Introduction

Modern medical practice is essentially different from that in vogue during the latter years of the past century. Now emphasis is placed on preventive medicine; no longer does medical science apply itself largely with the care of the individual overcome with disease. In fact, today when sickness or disability occurs, it is not considered as something to be expected, but rather in many instances as a reflection upon the individual himself, his previous medical advisor, or on the general intelligence of his community. To live up to these standards general mortality statistics must be surveyed, morbidity rates compared and the exciting and predisposing causes of disease accurately known. During the last fifty years one by one the life cycle of organisms attacking humans has been revealed, with intelligent remedial means applied. The industries have instituted measures for pro-

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tecting workmen from dust and other activating agents of disease, but it has been only within the past decade that closely applied effort has been made to locate predisposing factors in the physical makeup of the individual with consequent suggested readjustments to physical and mental strain. The medical histories of the World War contain complete data concerning the general physical potentialities of the young male adult of our country. It is of interest to note that prior to December, 1917, 3,764,000 men were sent to camp from civil life, of whom 550,000 were rejected because of defects, of which 11.5 per cent were cardiac, while other circulatory defects brought the percentage to 15.[1] These revelations cannot be too often reiterated. As a result of the revealed data there is a general awakening; we see organized, national associations for prevention of heart disease, and also we hear the slogan "Have a health examination on your birthday." This latter takes admirable care of the individual who is fully matured and who fully sees the rationale of this maneuver. The child is amply taken care of by the intelligent parent, but what of the adolescent who is going through a period of rapid growth and development and meanwhile gaining self-assertiveness which often precludes the parents taking him for a health examination? And further, what about groups of adolescents who are engaging in competitive sports in our secondary schools? Our Government is keenly alive to the necessity of careful physical surveys when one applies for entrance to the Aviation Corps or other branches. Colleges make adequate physical examinations of their athletes, but it is my belief that municipal governments as a rule fail to furnish sufficient personnel in the medical inspection departments to make the proper estimation of the physical condition of the high school athlete. It is obvious that from the natural recuperative power of youth the stress and strain incident to striving to win in competitive games might only reveal itself in adult life. If there has been a lack of proper examinations of the prospective male athlete, the other sex has suffered even more from inattention. The pendulum has swung far from the type of adolescent girl who graced the Victorian era. Her outdoor athletic pursuits consisted of engaging in such games as croquet and possibly tennis, while in the gymnasium her physical development depended on wand drills and other exercise consistent with the clothing and behaviour demanded by that highly respected but changeable quality "good taste." Now we note daily in the press the performances of girls in competition on the track, in the pool, or on the field, where their records approximate those made by the male. The girl in competitive games is encouraged and she is gaining a place of prominence.

A search of the literature fails to reveal but few studies of groups of girls engaging in athletic sports. It may be all too new. However, it is of interest to note that there is published an article[2] showing that there is a part of the world where the girl in her attitude toward athletics apparently is not far different from the Mid-Victorian girl. A plea in this article is made for further participation in exercise, and through biological comparison shows that there is no fundamental reason for woman's supposedly physical inferiority. This comes from India with an added plea for more frequent physical examinations of girls in colleges, and the succinct statement that "a weak girl should not waste vitality and energy in over-exercise."

Mortality statistics[3] in the United States show that disease of the heart leads all other causes of death. Disease of the blood vessels is third in order of frequency. Knowledge of the foregoing in part led me to choose the cardiovascular system for applied study. Surely this system requires the closest observation and its integrity is fundamental to the athlete.

For a number of years it has been my opportunity to make an estimate of the physical condition of both young men and young women who are candidates for athletic work. Anthropometric measurements have been made and the individual has been studied with a view to the gaining of knowledge as to his physical potentialities, but heretofore no attempt has been made to record or to correlate my findings in special groups. My thought in the selection of girls in secondary schools who are candidates for or participants in such competitive athletics as tennis, swimming, hockey and basket ball was not only to obtain data so that those not physically fit might be eliminated, but to afford a stimulus for more careful survey of the material which presents itself in our secondary schools for indulgence

in these sports. It is unfortunate but true that the connotation "athletic type girl" has been made to include the girl who enters into competitive sports regardless of her physical fitness. Thus we have in an article by Domez, Dawson, Mathis and Murray[4] in the *Journal of the American Medical Association*, May 8, 1926, the title of which is "Cardio-vascular Reaction in Athletic and Non-Athletic," this statement: "To be sure, a good physique is as a *rule* associated with athletic activities either as cause or effect or both, but this is not necessarily the case, and it may be that some of the girls whom we have designated athletic were *physically below par* . . ." This cites an unfortunate trend and shows a promising field for preventive medicine. Through some channel the young man or young woman who is physically defective should be eliminated from any participation in competitive sports by the school authorities. Let the term "athletic girl" then be synonymous with "good physical condition."

Discussion

One hundred and fifty girls, candidates for or participants in competitive swimming, hockey, tennis and basket ball, were available for study. One hundred thirty-one attended public high school; nineteen were pupils in a private preparatory school.

It was realized that it would be necessary first of all to select the type of data that could be used most advantageously. The following outlines my selection. In subsequent paragraphs will be set forth the reasons for this choice:

1. *General Nutrition:* Height-weight-age ratio.

2. *Functional Tests:* Heart rate standing, the pulse rate immediately after twenty-five hops on each foot at rate of one hop per second; pulse rate immediately following three-minute rest, and finally the blood pressure, systolic and diastolic, estimated with mercury sphygmomanometer.

3. *General Clinical Observations Pertinent to the Circulatory System:*

(a) Quality of heart sounds, their relative intensity.

(b) Any detectable arrhythmia.

(c) Presence of adventitious sounds with their route of transmission.

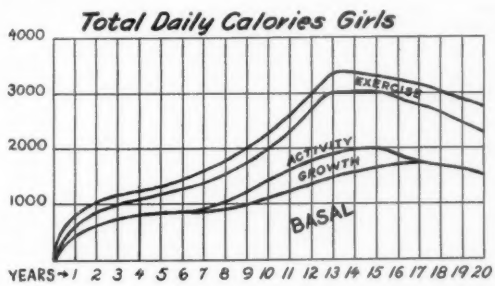
(d) Condition of the wall of the radial artery.

(e) Miscellaneous data, including such items as sweating hands, tremor, dermatographia, enlargement of thyroid, etc.

4. *Results Obtained by Use of Electrocardiograph, Roentgen Ray and Basal Metabolism Machine in Selected Cases.*

1. General Nutrition

Of fundamental importance to a properly functioning cardiovascular system, as well as to any other system in the adolescent, is the state of nutrition. It might well be reasoned *a priori* that a malnourished growing girl cannot possess a circulatory apparatus worthy of indulgence in competitive athletics. The adolescents' caloric intake is expended for his basal needs, his growth, his energy requirements and finally in the inevitable wastage. At this stage of life his requirements for energy are unusually large and it can readily be seen that if there is an imbalance in the expenditure for energy with the intake, it must be at the expense of growth or even his very basal needs. The amount of loss in excreta remains quite constant. Holt,[5] in his book, "Good Health and Growth," states that "it is a common observation and undoubtedly a true one that during adolescence the average boy or girl takes more food than the average adult man or woman." Below is a graph taken from Holt:



A comparison was made between the height-weight-age ratio of the individual with figures in the table prepared by Baldwin, T. Bird and Thomas D. Wood.[6] A variation of 10 per cent was deemed of sufficient importance to record the individual as being of abnormal weight. Of 131 girls from the high school twenty-four or 18.3 per cent were overweight, and thirty-one or 23.6 per cent were underweight. In the private school group, of the nineteen girls, four or 21.05 per cent were overweight, and seven or 36.8 per cent were underweight.

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2. Functional Tests

The literature is particularly fertile in material relating to functional tests for physical efficiency. It might be well first of all to outline basic physiological facts culled from the work of scientists, from which the rationale of the tests is derived.

Bowen[7] in the *American Journal of Physiology*, 1904, appears to have been the first to systematically investigate changes in pulse rate actually occurring during muscular work. From his observations he concludes that there is a sudden rise in pulse rate at the beginning of exercise, followed by a more gradual secondary rise. The secondary rise continues until end of work. It then ceases, the pulse rate falling suddenly and rapidly. This in turn is followed by a slower secondary fall.

Bainbridge[8] states, speaking broadly, "The acceleration of the pulse for a given intensity of muscular exertion varies inversely with the contractile power of the heart. As the limits of exertion are reached, however, this difference between the trained and the untrained tends to disappear. During heavy muscular work the venous inflow to the heart must be so large that every heart dilates almost to its full size during diastole and its output per minute then becomes directly proportional to its pulse rate."

Pembrey[9] is quoted as follows: "The limit of efficiency as regards the heart beat appears to be reached at 160 per minute, but doubtless there are individual differences."

Flack and Bowdler,[10] from a study of reactions following stepping on and off of chair five times in fifteen seconds, conclude that heart rate in healthy subjects should not increase more than twenty-five beats and should return to normal in thirty seconds.

The following observations on blood pressure in its relation to exercise are of interest:

Rosen and White[11] in the *American Journal of Physiology* state that "pulse pressure is directly proportional to stroke volume under conditions that have essentially the same diastolic pressure and pulse rate."

Krogh and Lindhard[12] give something which tends to show the difference between the trained and the untrained in physiological response to exercise. It supports Bainbridge. They state that "increased minute volume of the heart necessary in performing increased work is obtained to a much greater extent by increasing output per beat and to much smaller extent by acceleration of the pulse in the trained, more than in the untrained."

Ernest Boos[13] adds: "An increased output of the heart by increasing the elastic distention of the wall of the aorta will elevate systolic blood pressure. The diastolic pressure remains unchanged unless there is alteration of the peripheral resistance, either after exercise or with presence of exophthalmic goiter."

As a resultant of a survey of these facts, it would seem desirable, first, to estimate the pulse rate, then, after giving the heart muscle a definite load, noting again the pulse, and later recording the rate after a rest period. The estimation of the blood pressure, systolic and diastolic, would have a definite role.

The most serious attempt to give a measured load to the heart with estimation of pulse rate and blood pressure reaction that could be located in the literature is by Gillespie, Gibson and Murray.[14] They used a convertible ergometer giving a load up to five kilograms and also a metronome for accurately recording rate of movement. Their work is significant in confirming what is stated above on the effect of training on repeated performance of definite work. They found the pulse tended to be slower after frequent reptition of same work at few days interval. It should be noted that their estimation of pulse rate was made while the work was actually being accomplished.

E. C. Schneider,[15] to eliminate the personal equation and to give a practical method of grading aviators for physical fitness, rates numerically the response to six observations:

(1) Pulse rate reclining.
(2) Pulse rate increase on standing.
(3) Standing pulse rate.
(4) Pulse rate increase immediately after exercise.
(5) Return of pulse rate to standing normal after exercise.
(6) Systolic pressure standing, compared with reclining.

He assigns points arbitrarily for the various responses.

Crampton[16] expresses our belief concerning Schneider's work when he says, "To make a scale of six different tests and to adjust them to each other . . . is perhaps more ambitious than some of us care to essay." Then, too, as others have pointed out, sources of error would occur in the underestimation of the efficiency of an individual with a rapid heart due to psychic disturbance incident to

examination and the giving of a too high rating to bradycardias.

Bloedorn,[17] in an article in the *American Journal of Medical Science*, outlines a method used in estimating cardio-vascular efficiency in the Navy:

(1) Listening to heart.

(2) Twenty hops each foot (rate one per second).

(3) Blood pressure and pulse rate immediately before and after.

The plan of procedure employed herein will be seen not greatly dissimilar to this. More elaborate tests were not thought practical and it is believed would not have had greater value. A survey of the results given on pages i to v of appendix will show first of all that to an extent, probably on account of emotional impulses, the initial rate was often considerably higher than the rate after the rest. Effort was made to combat the psychical element by having the subjects enter the examining room one at a time in so far as possible. Another factor tending toward a more rapid initial rate was the taking of the initial pulse rate while standing. The rate after rest was taken while sitting. Under these conditions, the failure of pulse to assume the pre-exercise rate is the more notable. Those showing a constant rate of 100 or above were arbitrarily placed in a tachycardia grouping. In this class there were found forty-three or 32.8 per cent among the high schools girls, and seven or 36.8 per cent among the private school girls. Twenty-two or 16.7 per cent in the high school and four or 21.05 per cent in the private school showed an increase after exercise of twenty beats, with a failure to return to pre-exercise rate after three minutes. There was but one outstanding case of bradycardia. Here the rates, 56-88-60, warrant this designation. (See Case No. 62.) Those having a combination of elevated systolic blood pressure with tachycardia:

Fourteen or 10.6 per cent in the high school group.

Those having lowered systolic blood pressure:

Thirty-seven or 28.2 per cent in the high school.

Nine or 47.3 per cent in the private school.

I considered a systolic pressure of 125 mm. or above elevated while a blood pressure of 100 mm. or below as low. I quote the following as basis for establishment of these standards:

Dearborn[18] found an average systolic blood pressure in sixty-eight trained females, whose average age was 25.2 years, 114.1 mm.; while 147 untrained women whose average age was 19.8 years averaged 107.9 mm. systolic. He gives a rule which he states in no way is absolute, that from age of ten for the next twenty years each year represents a rise of 1 mm. of Hg.

In Table 43, the Association of Life Insurance Medical Directors and the Actuarial Society of America, published in 1925, there is seen among 1,025 female entrants for insurance under age of eighteen years, an average systolic blood pressure of 114.7 mm., average diastolic 75.8 mm., giving average pulse pressure of 38.9 mm.

The average systolic pressure for the entire group of 150 individuals in my study is 110.4 mm., with an average diastolic pressure of 67.4 mm., giving an average pulse pressure of 43. mm.

3. General Clinical Observations

These observations were recorded with a view to lending assistance through correlation in ascertaining the competency of the heart. Then, too, there was a desire to record for statistical value certain findings. A loud sudden first sound, a split first sound, or, as was noted in this study, *a roughened or impure first sound*, are always of interest to the clinician. The latter was noted in seven instances, all of these exhibiting a variance from the clear booming muscle sound normally heard. The relative intensity of the second sounds at the base is of undisputed value. As isolated findings, sixty-two showed a greater second pulmonic, in seventy instances the second aortic was definitely accentuated, while in eighteen instances the second pulmonic was noted as equalling the aortic sound. Extreme care was utilized to avoid error in instances of the sounds approximating each other in intensity. If there was any doubt, the sounds were recorded as equal. Not as isolated phenomena, however, but in their correlation with each other and other findings are these heart sounds of most value.

Arrhythmias in this series were of three types: first, that type which is characterized by an acceleration of rate with inspiration with a subsequent slowing during expiration (sinus arrhythmia), sixteen hearts exhibiting this; the second type was that in which there was found a "dropped beat," (extra systole).

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In three instances this was recorded. One heart showed acceleration of rate without reference to respiratory cycle (seemingly a form of paroxysmal tachycardia).

In consideration of intra- and extra-cardiac adventitious sounds (murmurs), we have again interesting data. No argument is necessary for their incorporation, but we should realize how much less emphasis is now placed on murmurs than formerly. Even though the murmur may be shown by other studies to represent organic changes at a valve orifice, a competent myocardium offsets this. Murmurs heard at the base, particularly over the pulmonic area, have long been considered largely functional, but it remained for Lewis A. Conner[19] in an article on cardiac diagnosis to express the modern trend when he states that .9 of all apical murmurs are accidental. Twenty-seven or 18 per cent exhibited a systolic murmur over the pulmonic area alone and untransmitted. In five instances, or 3.3 per cent, there was a systolic murmur over the pulmonic area with a concomitant systolic murmur over aortic area with apparent transmission to the vessels of the neck. In two instances there were systolic murmurs heard over the aortic areas alone. A frank apical murmur systolic in time was found in one instance; this seemed untransmitted.

The quality of the radial wall is particularly worthy of recording. Adolescence is not the period of life associated with atheromatous changes. When early changes are suspected at this period, they are of much significance. A wall palpable after shutting off the blood stream is recorded herein as "one plus." For an artery which was with difficulty obliterated with an outstanding wall, the designation "two plus" was pre-determined. There were no cases in the latter category. In twelve instances the arteries were noted as "one plus."

There is a type of data which, although not derived from direct examination of the circulatory system, has such bearing on estimating the extent of functional derangements that no study is complete without giving space for its recording. We refer to excessive sweating, especially of extremities, cyanosis hands, tremor, dermatographia, enlarged thyroid and exophthalmos. These phenomena of greater or less extent were found in ten instances. Again, as isolated phenomena these findings do not bear a comparable importance to their value in association with other findings.

4. Results Obtained by Use of Electrocardiograph, Etc.

As much as it would seem desirable, it was impractical to employ the basal metabolism apparatus, the X-ray and the electrocardiograph in all of these examinations. It was realized that nothing could be more valuable than the testing of inferences made from a general clinical survey using the means available to the average clinician against the results obtained by the use of these instruments of precision. The accumulative results from an entire special group would have no little value. In the premises our problem then was to use these adjunctive methods to the best advantage in a limited range. The procedure was to carefully survey the information that had been obtained through other methods and then in those cases where confirmatory evidence seemed most desirable, and full cooperation could be obtained, these special instruments were employed. The basal metabolism rate was estimated in seven cases. Six were radiographed and also from these same pupils electrocardiographic tracings were obtained. These data are on pages vi to xxiv in the appendix.

Correlation and Evaluation of Data

In a systematic survey of the material amassed in this study the following plan was adopted: To consider

(1) The nutrition findings in relation to heart rate and blood pressure.

(2) Tachycardias in their relation to:
  (a) Functional Disorder of Heart
  (b) Hyperthyroidism
  (c) Myocardial disease.

(3) Bradycardias, arrhythmias, abnormalities of sound, murmurs, in their relation to organic disease:
  (a) Correclated electrocardiographic and X-ray studies.

(4) Murmurs Pulmonic area.

Nutrition Findings

In consideration of the general nutrition we must beware of the presence of two types of faddist; first, the one who insists that all, despite a racial or familial background, must conform to a certain standard, and secondly, the ubiquitous disciple of the cult who is preaching that all girls must for beauty and popularity acquire a boyish figure. The preachings of either extremist are pernicious

to their effect. In discussing previously the admissibility of evidence in a circulatory survey of facts concerning nutrition, we made certain statements which would lead to the conclusion that malnourished adolescents should be excluded from severe exercise. We maintain that such a conclusion is valid. Of the thirty-eight girls underweight, fourteen or 36.8 per cent were in the hypotension class while eleven or 28.9 per cent exhibited tachycardia. Of the twenty-eight girls overweight, three or 10.7 per cent were in the hypotension grouping while twelve or 42.8 per cent exhibited tachycardia. The tendency then was for the underweight girl to have low systolic pressure and the overweight girl to show tachycardia. Type breakfasts and luncheons and time for retiring recorded in the hypotension cases were somewhat illuminating but data were not extensive enough for proper inference. and then too we are concerned chiefly with objective findings in this study. There was one outstanding case of overweight, No. 132; her weight alone should preclude competitive athletics. Under thirty years, longevity records give preference to those slightly overweight rather than to those underweight. We believe the underweight girl needs rest and not excessive exercise, especially those with marked hypotension. Overweight *per se* should not be a cause for exclusion from athletics except in instances similar to the one cited above.

Relation of Tachycardia to Functional Disorder of Heart and Hyperthyroidism

The problem of determining whether or not the individual studied possesses a competent circulatory apparatus uninfluenced by neurogenic difficulties is indeed a task. Let us give attention to the tachycardias as a group and note excerpts from the literature. John Parkinson[20] in the *Canadian Medical Association Journal* writes that "simple tachycardia, unless there is an underlying cause directly affecting the myocardium, does not seem to lead to heart enlargement or indeed failure." We learn much also from Lewis A. Conner,[21] than whom no one had a more extensive experience in the evaluation of data from cardiac examinations during the World War, when he says, "The most common error committed by my assistants was the mistaking of functional disorder for serious heart disease."

In another trend, J. M. H. Campbell,[22] in a *Guy's Hospital Report*, makes the statement that a slow fall of pulse after exercise indicates bad training, effort syndrome or anemia following influenza or accompanying tuberculosis.

It would be well to ponder for a moment over these authoritative words gleaned from the literature. The difficulty in making a positive decision, from clinical data alone, as to the cause of a tachycardia, is apparent. The preponderance in numbers of the cases of functional disorders is striking. Considering them we cannot neglect the condition variously referred to in post war literature as "D. A. H." (disordered heart action), nervous heart, neurocirculatory asthenia, or effort syndrome. Prior to 1914 this type of heart would have been declared an indication of neurasthenia, hyperthyroidism or incipient tuberculosis. In fact, hyperthyroidism was staunchly put forth as a cause of D. A. H. by Harlow Brooks.[23] Inherited constitutional disability and infection were advanced by Sir Thomas Lewis[24] in his original description. The symptoms often described, in addition to tremor, tachycardia, cold sweating cyanosed hands, dermatographia, are shakiness, flushed face and giddiness. Of those showing tachycardia we find cases 46, 19, 53, 52, 47, 42, 36, 34 and 3 exhibiting one or more of such findings as enlarged thyroid, dermatographia, tremor sweating hands or exophthalmos; cases 31, 12 and 37 show gross structural faults: i. e., depressed sternum, asthenic build, and spinal deformities. Basal metabolism estimations were made on cases 12, 47, 3, 15, 49, 39 and 42. It was desired to make estimations on all of the nine cases of D. A. H. with evident concomitant signs of hyperthyroidism, especially cases 52 and 53; however, only the cooperation of cases 3, 47 and 42 of this group was obtained. Those on whom the test was made exhibited the following:

*Case No. 12:** There was a rapid heart rate, increased blood pressure, tremor and spinal deformity. It is to be noted that at time of test her pulse was noted as 72. B. M. R. was found to be minus 5 per cent, Hb. 80 per cent.

Case No. 47: Again there was tachycardia, elevated blood pressure, tremor, enlarged thyroid. At time of test pulse rate was 96. B. M. R. was shown to be plus 5 per cent; Hb. 80 per cent. (Contradictory to clinical evidence.)

*Ambitious to be an aviatrix.

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FUNCTIONAL TESTS

Case No.	Age-Hgt.-Wgt.	Pulse Rate*	Blood Pressure	Heart Sounds	Murmurs	Rhythm	Remarks
1.	17-65-115	116-126-100	116/60	P2 g. eater		Extra-systole	
2.	16-69-133	148-132-88	130/84	A2 "		Paroxymal tachy	
3.	15-62-110	124-144-104	128/82	A2 "		Sinus arrhythmia	Dermatographia
4	12-63 7-107	128-128-108	116/56	A2 "			Enlarged glands in neck
5.	16-66-113	132-140-112	116/62	A2 "	Sys. over pulmonic		
6.	16-61-107	124-124-112	116/56	P2 "			
7.	17-65-126	112-140-104	130/76	A2 "			
8.	16-66-127	116-128-108	114/76	A2 "			
9.	17-66-123	116-132-108	122/74	A2 "	Sys. trans. to carotids		
10.	16-63-113	104-140-112	114/74	P2 "			
11.	15-65-140	140-136-104	130/58	A2 "			
12.	14-66-102	144-148-136	132/76	A2 "	Harsh sys. over Pulmonic	Extra systole	Tremor; scolios.s dorsal left. Some kyphosis
13.	16-62-162	100-116-108	116/64	P2 "			
14.	18-64-142	112-120-100	112/68	A2 "			Acne
15	14-62-103	148-160-88	120/62	A2 "		Sinus Arrhythmia	
16.	17-66-116	124-140-116	116/58	A2 "			One plus arteries
17.	16-63-129	108-124-100	116/74	A2 " (1st sound roughened)			
18.	16-65-125	104-128-104	104/66				
19.	16-66-105	112-140-112	122/84	P2 greater	Sys. over apex		Cold, wet hands, Acne
20.	16-65-110	136-110-128	126/76	P2 "		Slight arrhythmia	Acne
21.	14- ? - ?	132-132-132	126/80				
22.	17-65-141	132-120-104	122/68	A2 "	Sys. over pulmonic	Sinus arrhythmia	
23.	15-66-120	128-132-100	100/56	A2 " (Impurity 1st sound)			
24.	15-60-113	116-128-100	114/78	P2 greater			
25.	16-54-99	100-144-104	120/68	P2 "		Sinus arrhythmia	
26.	15-67-139	104-108-100	112/62	A2 "			
27.	16-64-117	116-128-116	134/84	P2 "	Sys. over pulmonic		
28.	16-61-107	108-140-116	94/68	P2 "			
29.	17-62-133	112-128-104	110/70	P2 " (1st roughened)			
30	17-62-109	100-156-108	108/74	A2 greater		Sinus arrhythmia	Evident pulsation in interspace to left
31.	15-62-99	108-128-104	108/66	P2 "			Sternum depressed
32.	15-59-100	140-148-120	112/70	A2 equals P2			
33.	13-62-95	124-134-112	90/74	A2 "			
34.	15-48-94	120-160-128	138/68	P2 "	Sys. over pulmonic		Cold, wet hands Tremor
35.	15-64-140	100-116-108	104/60	A2 equals P2			
36.	15-66-134	140-140-124	148/94	P2 greater			Cyanosed, moist hands; tremor; acne, enlgd thyroid
37.	17-67-107	96-128-116	124/66	A2 "	Sys. over pulmonic aortic areas, trans. to carotids		Asthenic type
38.	14-64-115	100-124-100	106/60	P2 "			Enlarged glands
39.	14-61-109	128-144-112	136/74				
40.	15-58-95	108-128-100	94/64	A2 "			
41.	17-66 127	112-120-112	112/54	P2 "			
42	16-68½-146	136-140-128					Tremor

*Before exercise, after exercise and after a 3-minute rest.

Case No.	Age-Hgt.-Wgt.	Pulse Rate*	Blood Pressure	Heart Sounds	Murmurs	Rhythm	Remarks
43	15-63-127	125-152-112	118/74	A2 "			
44.	16-64-123	108-128-100	94/58	A2 equals P2			
45.	17-62-110	108-120-100	114/28	P2 greater	Sys. over aortic area trans. to carotids		
46.	17-62-126	120-156-128	132/82	P2 "			Thyroid enldg. Dermatographia
47.	18-65-111½	136-140-116	132/76	P2 " Impurity 1st sound			Tremor. Enldg. thyroid
48.	15-63-132	120-148-108	104/72	A2 greater			
49.	14-63½-128¼	128-140-116	120/58	P2 "	Sys. over pulmonic		
50.	14-62-98	130-124-104	90/56	A2 "			Enlarged glands in neck
51.	17-64-125	126-120-112	104/62	P2 "			
52.	15-62-123	108-140-124	135/74	A2 "	Sys. over pulmonic		Perspiring hands
53.	16-62-127	152-168-140	114/78	P2 "			Enldg. thyroid. Tremor Dermatographia Sl. exopthalmos
54.	13-61-100	100-116-85	100/64	A2 equals P2			One plus arteries
55	17-63-128	108-120-84	120/62	P2 greater	Sys. over pulmonic aortic areas, trans. to carotids		
56.	17-69-132	80-100-76	126/84	A2 "			One plus arteries
57.	13-63-128	100-116-76	116/66	P2 "			Thyroid slightly enldg.
58.	18-62-118	84- 92-84	104/68	A2 "			"Quick pulse"
59.	17-59-121	84-108-80	114/60	A2 "	Sys. over pulmonic and aortic areas, trans. to carotids		
60.	14-60-92	112-140-92	125/54	P2 "	Sys. over pulmonic	Sinus arrhythmia	
61.	16-59-95	116-124-92	134/66	A2 "	Sys. over pulmonic	"	Slight acne
62	17-60-141	56- 88-60	122/86	P2 " 1st sound roughened		Slight arrhythmia	
63	15-69-131	88-128-100	114/88	A2 greater			One plus arteries
64.	16-63-104	104-104-88	114/58	P2 "			Cold, sweating hands
65	14-64-116	108- 96-92	116/80	P2 greatly accentuated		Occ extra systole	Plus arteries
66.	16-65-117	104-120-96	112/54	A2 greater			Tendency toward dicrotism. (Cardiac)
67.	16-62-115	96-108-96	118/66	P2 "		Sinus arrhythmia	
68.	18-62-104	100-108-96	100/72	P2 "		Some arrhythmia	
69.	17-62-110	76-104-80	132/64	P2 "	Sys over aortic trans. to vessels of neck		
70.	17-61-114	88-112-88	124/64	P2 "	Sys over aortic		
71.	12-55-75	96-132-120	106/60			Arrhythmia	One plus arteries
72.	16-63-92	88-108-96	108/64	A2 equals P2			One plus arteries
73.	17-67-135	76-112-88	120/78	A2 greater	Sys. over aortic		
74.	16-67-114	100-112-88	100/56	A2 "			One plus arteries
75.	14-62-115	72- 92-80	106/72	P2 " of different intensity.		Slight arrhythmia	
76	13-57-91	104-132-76	124/?	A2 greater	Sys. over pulmonic	Sinus arrhythmia	Appears anemic
77.	15-63-123	96-120-96	94/70	A2 "			
78.	15-62-104	104-132-80	94/68	P2 equals A2			
79.	15-62-106	112-128-88	94/52	P2 greater 1st roughened			Acne

*Before exercise, after exercise and after a 3-minute rest.

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Case No.	Age-Hgt.-Wgt.	Pulse Rate*	Blood Pressure	Heart Sounds	Murmurs	Rhythm	Remarks
80.	17-65-113	80-100-96	96/62	A2 greater			Prominent scapulae; Anemic Enlgd. glands
81.	16-66-126	96-140-96	94/50	A2 "			
82.	16-64-125	96-108-88	88/65	P2 "			One plus arteries
83.	14-62-115	80-104-80	98/74	A2 "			
84.	17-67-116	76- 92-92	96/70	A2 "			
85.	16-63-112	92-128-96	94/64	A2 "			
86.	14-62-100	108-100-88	92/64	A2 "			
87.	16-62-98	80- 96-92	88/84	P2 "			
88.	18-64-106	96-120-88	86/?	P2 "			
89.	12-62-84	108-124-100	94/62	P2 "			Enlarged glands in neck
90.	17-62-115	72- 88-68	86/70	P2 "			
91.	15-61-147	88- 88-88	98/56	P2 "			
92.	16-66-108	80-112-88	84/58	P2 "			
93.	15-61-104	80-104-92	94/58	P2 equals A2			
94	15-63-111	84- 92-76	94/58	A2 " P2	Sys. over pulmonic		
95.	15-65-123	108-120-84	94/60	P2 greater			
96.	15-66-147	108- 91-100	94/68	P2 "			
97.	15-61-107	104-120-92	80/52	A2 "			
98.	16-61-108	104-132-88	96/72	P2 "			
99.	15-62-110	84- 92-72	94/60	A2 "			Fingernail biter
100.	14-64-93	100-136-88	92/66	A2 "		Sinus arrhythmia	
101.	15-64-119	88-104-84	96/60	A2 "			
102.	18-63-128	80-120-80	96/62	P2 "			One plus arteries
103	17 63-154	68-104-60	92/58	A2 "			
104.	16-61-112	76-104-76	98/64	A2 "			
105.	17-63-104	96-120-72	98/?	A2 equals P2			Bad posture
106.	14-60-106	88-100-92	96/50	P2 greater			
107	16-62-99	92-104-88	96/64	P2 "			
108.	15-64-108	100-104-88	96/64	A2 equals P2			
109.	15-63-91	100-112-80	98/72	A2 greater			
110.	14-65-126	92-120-104	98/72	A2 "			
111.	15-62-113	80-100-68	80/56	A2 " 1st sound roughened			Appears anemic
112.	15-63-142	96-124-88	96/58	P2 greater			
113.	16-62-108	100- 96-80	98/74	P2 "			
114.	17-61-120	112-120-88	118/64	P2 "	Sys. over pulmonic		
115.	15-63-126	84-116-84	134/58	A2 equals P2	Sys. over pulmonic		
116.	17-59-112	100-128-84	116/72	A2 greater P2	Sys. over pulmonic		
117.	15-61-91	104-112 80	106/66	A2 "	Sys. over pulmonic		
118.	16-61-102	96-108-96	110/70	A2 "	Sys. over pulmonic		
119.	18-64 126	96-120-84	114/50	P2 "	Sys. over pulmonic	Sinus arrhythmia	
120	15-68-137	112-140-84	112/72	P2 equals A2	Sys. over pulmonic		
121.	17-62-117	112-104-80	114/72	A2 greater	Sys. over pulmonic		
122.	17-64-126	108-116-96	110/58	A2 "	Sys. over pulmonic		
123.	15 64-118	88-112-96	115/75	A2 "	Sys. over pulmonic		One plus arteries
124.	18-61-105	80- 85-72	114/62	A2 "	Sys. over pulmonic		
125.	17-67-136	108-108-96	112/76	A2 "	Sys. over pulmonic		
126.	17-63-119	108-120-96	134/90	A2 "	Sys. over pulmonic		
127.	17-64 123	72-124-76	116/64	P2 "	Sys. over pulmonic		
128.	15-61-118	104- 88-92	112/72	P2 "	Sys. over pulmonic		
129.	17-61-105	96- 88-88	106/56	A2 "	Sys. over pulmonic		
130.	17-64-145	110-116-84	126/87	P2 "			
131.	18-66-116	84-108 56	114/58	A2 "			
132.	18-60-150	80-116-88	124/76	P2 "			

*Before exercise, after exercise and after a 3-minute rest.

Case No.	Age-Hgt.-Wgt.	Pulse Rate*	Blood Pressure	Heart Sounds	Murmurs	Rhythm	Remarks
133.	16-65-96	108-108-96	112/76	A2 "	Sys. over pulmonic		
134.	17-63-105	84-100-96	112/88	A2 "			
135.	14-59-79	96-128-96	120/74	P2 "			
136.	17-66-213	76- 88-84	108/54	A2 "			
137.	15-64-153	96-120 96	112/86	A2 "			
138.	14-68-167	100-116-88	108/78	A2 "			
139.	16-66-110	88-104-80	106/76	P2 equals A2			
140.	15-65-154	96-140-92	124/76	P2 greater			
141.	17-63-149	104-116-76	124/66	P2 "			
142.	15-66-187	84-104-96	132/78	A2 equals P2			
143.	15-64-144	72-112-88	106/62	A2 greater			
144.	16-62-138	92-120-72	116/74	A2 "			
145.	16-65-107	84- 88-92	104/58	P2 "			One plus arteries
146	15-66 154	80- 84-72	104/68	A2 equals P2			
147	17-65-105	84-112-84	108/72	P2 greater			
148.	15-66-117	108- 88-80	108/56	A2 equals P2			
149.	15-62-91	96 120-96	134/64	A2 greater			
150.	17-64-111	100-108-72	112/86	P2 equals A2			

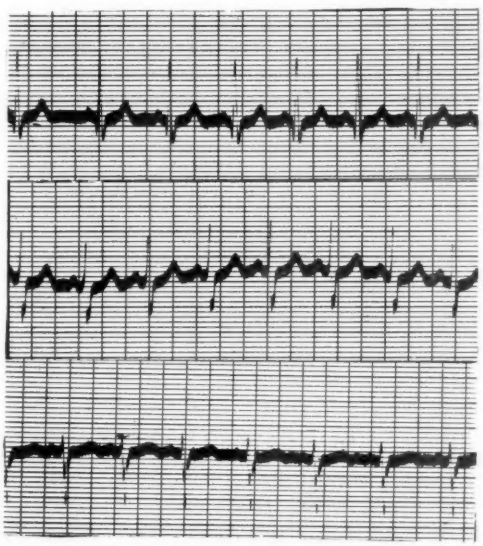
*Before exercise, after exercise and after a 3-minute rest.

Case No. 3: Tachycardia, increased blood pressure, dermatographia; pulse at time of test was 80; B. M. R. Plus 2 per cent; Hb. 82 per cent.

Case No. 15: Tachycardia (although at time of test rate was 76); B M. R. Minus 10 per cent; Hb. 88 per cent.

Case No. 49: Tachycardia, enlarged glands in neck, pulse at time of test 72; B. M. R. Plus 16 per cent; Hb. 90 per cent.

Case No. 39: Tachycardia, elevated systolic blood pressure (136/74); pulse at time of test 92; B. M. R. Plus 22 per cent; Hb. 85 per cent. See electrocardiograph appended.



Case No. 39.—February 6, 1929.
Rate: 110 auricular and ventricular. P. R. Int. .17.
Graphic Interpretation:
1. Axis minus 24°. Left axis deviation.
2. Sinus arrhythmia and simple paroxysmal tachycardia.

Case No. 42: Tachycardia; B. P. 132/66; tremor; pulse rate at time of test 96; B. M. R. Plus 17 per cent; Hb. 85 per cent.

Full details of these estimations, which were performed by a technician from the laboratory of Dr. Oscar B. Hunter, are recorded pages vi to viii in appendix. It will be seen that of the seven pupils who were selected and able to cooperate, three or 42.8 per cent showed a rate in excess of Plus 15 per cent, which is suggestive of there being a mild hyperthyroidism. It is believed that a like or greater percentage of the group with the recognized concomitant symptoms would have shown an abnormally high B. M. R.

Pupil No. 12, owing to her spinal deformity and heart rate, No. 31 with sternum deformity, and No. 37 with asthenic build and with heart which failed to assume pre-exercise rate, through their structure may conform to the type of D. A. H. noted by Sir Thomas Lewis[25] in his original description as caused by "inherited disability."

Further, Pupils 10, 25, 28, 30, 34, 37, 46, 52, 62,* 63, 69, 71, 72, 73, 75, 80, 85, 92, 93, 96, 110, 123, 127, 132, 142 and 143 showed an increase after exercise of twenty beats or more with failure to return to pre-exercise rate in three minutes. Although very few are pronounced cases, it would seem that most of these girls actually or potentially are in the effort

*Bradycardia.

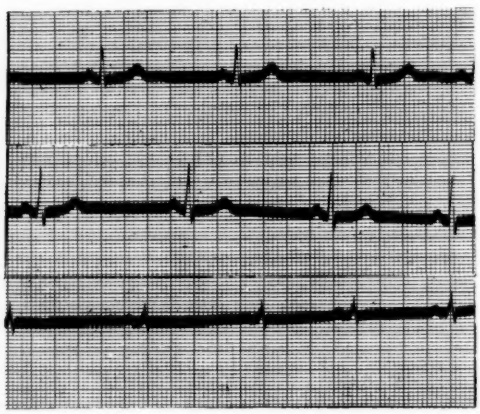
syndrome class and rather need at present a lighter grade of exercise than the sudden severe strain incident to competition.

It is of interest that in *Students 4, 38, 50 and 89, enlarged glands in neck were a prominent factor, indicating possible foci of infection in throat.

Tachycardia in Relation to Myocardial Disease

Cases 19, 2, 16, 30, 29, 23, 17 and 1 have, in addition to tachycardia, such findings as impurity of first sound, murmur at apex, slightly thickened radials, abnormal pulsations, rhythm upsets such as extra systoles, acceleration of beats—the latter not sinus arrhythmia—and aortic murmurs. They may be classed as suspects of organic difficulty. We should again note the experience of Conner, and also bear in mind that myocarditis is very rare in young people when unaccompanied by appreciable hypertrophy. These girls then may still be entirely in the category of functional heart disease, but the evidence elicited is worthy of thought. We have to leave them, owing to limitation of this work, as suspects, and recommend that a further observation be made.

Tachycardia at best reveals poor training and has been shown to improve with applied effort. Probably some of those presenting rapid heart action, with proper attention given by physical instructor would show different reaction to exercise at a later time.



Case No. 62.—April 4, 1928.
Rate: 45 auricular and ventricular. P. R. Int. .16.
Graphic Interpretation:
1. Axis plus 63°—normal.
2. Sinus bradycardia and sinus arrhythmia, probably arising from over-activity of the vagus.

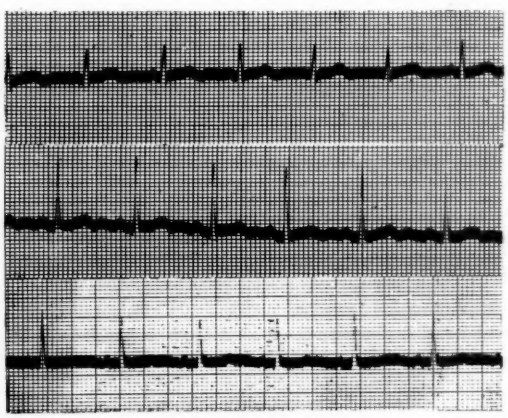
*This observation made only on preparatory school group.

Bradycardia

As has been stated, one girl exhibiting bradycardia was found, vide No. 62. In addition there was a roughening of first sound with a slight arrhythmia. She was also overweight. Because of the slow rate, an electrocardiograph and X-ray study were made to determine whether the bradycardia was neurogenic or myogenic in origin. Sinus bradycardia was graphically shown (see accompanying electrocardiagraph) there being no evidence of myocardial disease. It is known that a slow heart does not necessarily mean diseased muscle. In this particular case there should be a search made for presence of an etiological toxic factor which often accompanies sinus bradycardia.

Abnormalities of Heart Sounds and Rhythm in Relation to Organic Disease

Cases 54, 56, 58, 65, 55, 58, 59, 60, 61, 63, 64, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75 and 76, in all twenty-two pupils, show either rhythm



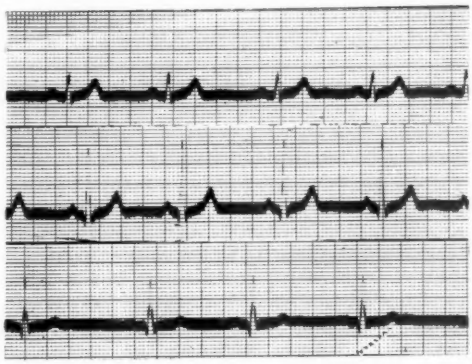
Case No. 65.—April 25, 1928.
Rate: 60 auricular and ventricular. P. R. Int. .18.
Graphic Interpretation:
1. Axis plus 68°—normal.
2. Sinus bradycardia, probably arising from over-activity of the vagus.

upsets extra systole "quick pulse," systolic murmur over aortic area transmitted to neck vessels, thickened radials or abnormalities of sound. Case No. 56 showed elevated systolic pressure in addition to thickened radials. It would have been particularly desirable to have made a study of all with electrocardiograph. Cooperation was obtained in cases 65, 55, 67, 68 and 59; of them electrocardiographic and X-ray studies were made. These studies were accomplished through the cooperation of Dr.

James Alexander Lyon. The following is a discussion of the individual cases:

Case No. 65: This girl showed a marked accentuation of the second pulmonic, and what appeared to be an occasional extra systole; her arteries were recorded as "one plus." With the marked accentuation of the second sound to left of sternum, it was desired to know if there was anything of an intra-cardiac nature causing this. The electrocardiograph exhibited a sinus arrhythmia; the extra systole was not confirmed. It remained for the Roentgen ray examination of chest to reveal what I believe to be the probable cause of the accentuation. There were found not only enlarged glands at hilus but marked peribronchial thickening, suggesting increased resistance, with accompanying increased pressure in the lesser circulation. Her lungs need further study.

Case No. 55: This girl exhibited a systolic murmur over both the pulmonic and aortic areas with transmission to carotids; her second pulmonic was greater. A so-called functional murmur is heard over both the pulmonic and aortic areas at times. A coincidental murmur over carotids may mean an



Case No. 55.—April 25, 1928.
Rate: 55 auricular and ventricular. P. R. Int. .18.
Graphic Interpretation:
1. Axis plus 70°—normal.
2. Sinus bradycardia and sinus arrhythmia, probably arising from over-activity of the vagus.

aortic sternosis; with this, the murmur over aortic areas is usually harsh and there is heart enlargement. Roentgenogram of heart showed no apparent enlargement.

Case No. 67: Showed on clinical examination an accentuated second pulmonic with an arrhythmia. Some enlargement of heart to right was demonstrated by X-ray.

Case No. 68: Gave clinically an arrhythmia with accentuation of P2.

Case No. 59: Here we have again a systolic murmur over both aortic and pulmonic areas transmitted to carotids, accentuated A2.

It is thought that all of the twenty-two cases exhibiting signs of various degrees of cardiac involvement such as rhythm upsets, extra systole, "quick pulse," etc., should be under observation. Case No. 65, as stated, should have a careful examination of lungs. Cases 55, 59, 67, 68 and 65, the two former who had suggestive electrocardiographic findings, should be restricted to exercise not involving competition. Although a definite diagnosis cannot be made in cases 55 and 59, a stenosis of the aortic orifice would seem eliminated because no enlargement of heart was demonstrated. An aortitis is suggested on account of murmurs. It should be borne in mind that "heart strain" is a real entity. Morris H. Kahn and Samuel Kahn,[26] examiners in New York State Department of Labor, writing in the *Annals of Medicine* state ". . . observations made in athletes indicate that prolonged over-exertion even in the trained individual may affect the heart . . ." "It (heart strain) will come on earlier . . . when the heart is not mature—as in young adolescents who do vigorous exercise." Further they state, "The electrocardiogram indicates left ventricular predominance."

Extra Systoles

Extra systoles were shown in study of cases 12, 1 and 65. Of this rhythm upset it might be said that it does not necessarily indicate disease although it often accompanies a diseased myocardium. Middle age is the time for their frequent occurrence. We feel with S. Calvin Smith[27] that extra beats are always a sign of protest and should be respected. It should be noted that the electrocardiograph of case No. 65 did not confirm the clinical finding. As extra systoles notoriously are irregular in time of appearance, their absence in electrocardiographic tracings does not vitiate the clinical finding.

Systolic Murmurs Over Pulmonic Area

Concerning the soft non-transmitted systolic murmurs over the pulmonary area described by the French as Les Souffles Anorganiques on page 74, Diseases of Heart, by Vaquez-Laidlaw,[28] published by Saunders, 1925, we learn that Potain taught that they were extra-

cardiac or, better, cardiopulmonary, because they arose not from the heart but from the lungs. According to his explanation with systole there is a retraction of heart with creation of vacuum, the adjoining anterior borders of lung being filled with an inrush of air. During inspiration it is the external air; during expiration the residual air. E. Thomas[29] in an article in the *Revue Medicale de La Suisse Romande* states that these murmurs are rare before the age of three and one-half years. He further points out that they are more frequent in females at puberty. He states their exact cause is not entirely known, but he leans toward acceptance of Potain's view. Deep breathing plus tachycardia favors their development and, as Thomas states, they are most frequently found in females near age of puberty. Relaxation of pulmonic orifice and anemia also are advanced as causes. On page 78, Vaquez does not support Weil's view that pressure on eye-balls will eliminate extracardiac murmurs, although, according to Vaquez, it will slow a rapid heart.

As given above, 18 per cent of the girls exhibited this murmur, soft in quality and limited to pulmonic area.

NOTE.—Electrocardiography and Interpretation by Dr. James Alexander Lyon.

SUMMARY

1. A study is made of the objective findings relating to the circulatory system of 150 adolescent girls who are candidates for or participants in competitive athletics.

One hundred and thirty-one were high school students,

Nineteen were students in a private preparatory school.

2. High school:

Twenty-four or 18.3 per cent were overweight,

Thirty-one or 23.6 per cent were underweight.

Private school:

Four or 21.05 per cent were overweight,

Seven or 36.8 per cent were underweight.

3. Of total of twenty-eight girls overweight

Three or 10.7 per cent were in hypotension grouping,

Twelve or 42.8 per cent exhibited tachycardia.

Of total of thirty-eight girls underweight

Fourteen or 36.8 per cent were in hypotension class,

Eleven or 28.9 per cent exhibited tachycardia.

4. The following showed poor response to functional tests:

High School: Twenty-one or 16.03 per cent,

Private school: Three or 15.7 per cent.

5. Blood Pressure average for 150 girls:

Systolic: 110.4 mm.

Diastolic: 67.4 mm.

Pulse pressure: 43 mm.

6. Average age entire group: 15.7 years.

7. Elevated systolic blood pressure with tachycardia:

High school: Fourteen or 10.6 per cent.

8. Hypotension:

High school: Thirty-seven or 28.2 per cent.

Private school: Nine or 47.3 per cent.

9. Somewhat thickened radials:

(Entire group): Twelve or 8 per cent.

10. B. M. R. was estimated in seven instances:

Three or 42.8 per cent showed a rate in excess of Plus 15 per cent.

11. Electrocardiographic studies and X-ray revealed in six cases:

1 Left axis deviation. Sinus arrhythmia and simple paroxysmal tachycardia.

1 Simple paroxysmal tachycardia.

2 Sinus bradycardia and sinus arrhythmia. Probably arising from an overaction of the vagus.

1 Sinus bradycardia. Probably arising from over-activity of the vagus.

1 Enlarged glands at hilus.

CONCLUSIONS

1. It is revealed that there are a number of girls presenting findings that should preclude their engaging in competitive sports. From this study we would state the criteria for disqualification as follows:

(a) Underweight with hypotension.

(b) Tachycardia with poor response to exercise.

(c) Tachycardia plus hypertension with other evidence, based either on clinical signs or B. M. R. test of hyperthyroidism.

(d) Rhythm upsets with impurity of first sound or transmitted murmurs at base.

(e) Demonstrable evidence either through electrocardiograph or X-ray of probable myocardial involvement.

It must be recognized that a number of individuals will be found in this survey and

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other studies who do not fall in these groupings but who should be excluded for evident disability; and further that there may be individuals failing at one time to qualify physically who later, after proper training, may be acceptable.

2. It may be inferred that studies of other groups of adolescents engaging in competitive sports would reveal as many individuals who would obviously jeopardize their well-being by engaging in strenuous exercise. Physical educators and municipal authorities should beware of this and see that adequate personnel is furnished the medical inspection service to perform these examinations.

3. As a procedure in preventive medicine, careful physical examination of candidates for or participants in competitive athletics in secondary schools is capable of abundant accomplishment.

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URINARY BILHARZIOSIS.*

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Fortunately for the folk of the United States of America, urinary bilharziosis, or schistosoma haematobium, as it is also called, is not often encountered among them. This diseases is named after Bilharz, who first associated the concurrent hematuria with the parasite at Cairo in 1851. The genus of snails, the *bullinus*, which acts as the host of the flukes causing the disease, is not infested with these parasites in this country. Therefore, the only cases which come to the attention of American doctors are those in which the infection has been picked up in lands like Greece, Egypt, Syria, Turkey, Uganda and South Africa. For this reason, the disease is but a casual occurrence here; this state of affairs, however, is by no means true in the countries mentioned above.

Seeing it so seldom, American physicians might be led to think that urinary bilharziosis is rare in any part of the world. This would be a totally erroneous concept of the matter, as it is not only very grave and distressing in certain of the states bordering upon the Mediterranean sea, and in northern Africa, but it is also very common there.

Sharply and concisely to place the amount of schistosoma haematobium in its proper setting in the understanding, recourse is had to a recent report of Dr. Khalil, Professor of Parisitology in the Faculty of Medicine, Cairo.

*Read before the April meeting of the Staff of Protestant Hospital, Norfolk, Va.

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To determine the possibility of eradicating the infestation in an endemic area, he selected the Egyptian oasis, Dakhla, for his experiment. This oasis is situated some four hundred miles from the Nile river. It is reached partly by railway and partly by desert motor cars, so that its location ensured a complete isolation rarely available elsewhere.

Quoting from this very interesting, unusual, and effective work, we find: "Forty per cent of the inhabitants of the village submitted their excreta for examination; 63 5/10 per cent were found infested with schistosoma haematobium. The main stream of the village, originating from an artesian well, was found to contain large numbers of *bullinus* snails. Copper sulphate was continuously added to the stream for four days and nights by a specially improvised apparatus. At the end of the experiment all *bullinus* snails were dead."

"After six months the area was visited again and carefully surveyed. No living *bullinus* snails could be found, in great contrast to their abundance before the experiment. The six months interval was the hottest period of the year, and the most favorable time for the propagation of the mollusca. The area will be surveyed at intervals, and if the results are as good, similar experiments will be tried in the Nile Valley itself. No deleterious effects were observed on the vegetations, animals, or man as the result of the experiment."

Thus we see that more than one-half of the natives of Dakhla, whose excreta was examined, were positive for the disease. This gives us a correct mental picture of the prevalence of bilharziosis in certain parts of northern Africa, and when we are called upon to treat a sojourner from those parts for urinary disturbances, we should bear in mind that possibly we are confronted with a case of schistosoma haematobium. To do otherwise would be to court an experience similar to that narrated in the first of the two cases reported later on in this article.

The selective affinity of schistosoma haematobium to the urinary system is an unsolved puzzle to the parisitologist. It seems to avoid most seduously all other parts of the body except those that are components of the urinary mechanism; by all odds the most frequent victim of these is the bladder. However, the method of approach *is* understood, and the *modus operandi* is a queer and devious phenomenon.

The ova pass out of the human in the urine, and then they will not live long unless they quickly reach water. There, however, they soon change into the stage of the life cycle known as miracidium. The miracidium is able to swim about at will in water; it cannot and will not infest man. Unless the miracidium finds a snail, like the *bullinus*, within forty-eight hours to act as an intermediate host, it dies. Having found an acceptable intermediate host, the miracidium proceeds to form a sporocyst in the liver of the snail. After a varying period of days the male and female embryos that infest man are extruded from this hepatic sporocist into the water in which the snail lives. These embryos, the infective stage for man, can also swim about easily, and thus many of them come into contact with human beings.

At one time Allen believed that the embryos penetrated into man by way of the prepucial mucosa. Since all ages, and both sexes, suffer alike with the disease, this theory was a bit difficult to associate with women. It now appears to be more likely that both the mucous membranes *and* the skin may be the points of entry. Like snake venom, the embryo will not survive a normal hydrochloric acid content, so that the intestinal tract, unless the approach is through the anus, is not at fault when infected water is ingested.

Having gained an entrance into the human animal, the embryos quickly seek out the portal circulation, where the male and the female proceed to mate. In the process of mating they become firmly adherent one to the other, and in this wise they make their united way against the blood-stream to the small veins in the bladder. Upon reaching this location, they take up lodging, and the female begins to lay her many eggs. The eggs, or ova, penetrate deeply into the bladder walls. Many of them pass entirely through and emerge into the vesical cavity, where, as you recall, we found them at the beginning of the story.

The symtoms of urinary bilharziosis may vary from a slight, painless hematuria to the most intractable and agonizing cystitis. Along with this, there may be pathological conditions from the same cause in other parts of the urinary system, and then the symptoms may embrace all those that are ordinarily found in

the various types of inflammation noticed in these structures. If we bear in mind the fact that it takes from three to six months from the time of infestation until the female begins to lay enough eggs to give rise to symptoms, we appreciate the fact that the onset is apt to be mild. On the other hand, when we know that the disease may remain in the body for as long as four years in an active state, if it is not subjected to specific treatment, we see at a glance that here is a fertile field for an amazing diversity of pathology, together with a fine opportunity for wide and distressing symptomatology.

An uncomplicated carcinoma of the bladder usually is a painless thing. It is not until the neoplastic process has developed to the point of degeneration and ulceration that much physical distress is noticed. Such an area of necrosis is an avenue of entrance to pyogenic bacteria, and the mixed infection which follows is really responsible for the discomfort of the patient. So, likewise, it is with bilharziosis. Enormous numbers of ova—as many as four thousand a day—may be extruded from the bladder walls, and yet the patient may be free from painful symptoms. However, the *points of exit* of these ova are also *avenues of entrance* for pyogenic micro-organisms, and the concurrent pus infection is the agency which dooms the patient to his morbid hell. Then may follow prostatitis, ureteritis, urethritis and pyelitis, together with their individual trains of symptoms.

Long standing pathology of an acute inflammatory type is not prone to remain strictly localized. When it is aided and abetted by an active co-conspirator against the body welfare, like that of the burrowing ova of bilharziosis, extensive peregrinations into surrounding structures are by no means unusual, so that numerous and extensive sinuses and fistulae are often encountered. It would be both tiresome and inappropriate to trace this complexity of symptoms further to a gathering which is so familiar with the results of untreated and unchecked infections of the urinary tract. It is quite pertinent, however, to remark that bilharzia infections in the bladder often degenerate into carcinomata, and that vesical calcareous formations are frequent.

The diagnosis is most certainly made by finding the ova in the centrifuged urine. Failing in this, the history is so very suggestive that a diagnostician, who is conversant with the infestation, will seldom go wrong.

The modern, specific treatment of schistosoma infestations was introduced and put upon a sound basis by Christopherson in Khartum. Using intravenous injections of tartar emetic (antimonium tartrate), he reported the rapid cure of the disease in seventy cases. The drug seems to have a cumulative action toward the adult worm, and its results are controlled by observations upon the ova in the urine. For this purpose the freshly passed urinary deposit is mingled daily with warm tap water, and the hatching of the ova is watched. Under normal conditions they are hatched in about five minutes; after the injection of tartar emetic it is found that they are no longer passed in a viable state. Such ova as may appear in the urine are dark and shriveled. It is thought that the appearance of the ova altered in this manner, or their absence, coincides with the death of the adult worm.

The intravenous injections are given on alternate days over a period of fifteen to thirty days. Christopherson began with a dose of ½ gr., of the tartar emetic dissolved in 6 c.c. of sterile normal saline solution. The injection is increased at each dose by ½ grain rises until 2½ grains are administered at a single sitting. In giving the larger doses the total amount of the fluid is brought up to 10 c.c.

There are many drawbacks to the use of tartar emetic by the intravenous route. It induces a profound and debilitating cellulitis if it is deposited by accident outside of the vein. This is a grave obstacle in fat people and in children. A very distressing cough may follow its administration, while nausea and vomiting are not unusual. Death has occasionally resulted from its introduction into the venous circulation.

A new organic antimony compound has recently been introduced for the treatment of schistosomiasis. It is called fuadin, and it is injected intramuscularly. The abscess formation, chemical cellulitis, etc., which result from faulty administration of tartar emetic do not occur with this drug. It seems to possess none of the other constitutional drawbacks so frequently associated with the injection of tartar emetic. The duration of treatment has been shortened by fuadin from twenty-nine to nineteen days. The treatment, unlike treatment with tartar emetic, does not need any special

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skill in administration. The intermediate and late results are superior to those of tartar emetic.

Although no mention has been made of it in this connection, it has occurred to the writer that fuadin may be superior to tartar emetic, and other antimony compounds at American disposal, in the treatment of granuloma inguinale. Messrs. Hynson, Westcott & Dunning, of Baltimore, Md., are endeavoring to get in touch with the source of supply of fuadin, and in all likelihood experimental work will soon be done along that line in this country.

The reports of the two cases following are very instructive. The first was an advanced infestation; the second was recent in its onset. At the time that the first case was studied, insofar as Dr. Townsend, Surgeon of the United States Public Health Service, and the writer knew, but one other case had been reported in this country—that of Pederson. Unfortunately Pederson's report was not studied by us until we were looking up the literature at the time that we were contemplating publishing our case. In the first case the attendants were in the dark as to what they were dealing with at the beginning, and so failed to make an early diagnosis. For this reason the cure was much delayed, the patient was subjected to an unnecessary cystotomy, and, as a result of all this, he suffered much needless misery. In the second case the attendants were on guard, and the infestation was so quickly gotten under control that the patient experienced no inconvenience at all. May not this array of facts be an acceptable excuse for taking up so much of your time with the discussion of a disease so rare in America as is schistosoma haematobium, and for presenting so great a paucity of clinical material with which to illustrate the talk?

Case One.—On February 22nd, a married male patient, by occupation a seaman, aged 25, a native of Port Said, Egypt, was admitted to U. S. Marine Hospital No. 29.

Complaint. Sore eyes and loss of appetite.

Family History. Negative except that one brother had a severe form of bladder trouble.

Past History. Negative. Patient denies any venereal trouble.

Present History. Developed sore eyes eight months ago. Condition has gradually been becoming worse. Appetite has been deranged for several months.

Physical Findings. Cornea of both eyes hazy. Conjunctiva quite inflamed. Other findings negative.

Progress Subsequent to Admission. Conjunctivitis improved slowly under treatment. On March 24th, patient complained of severe pains in the bladder, and upon urination. At this time he developed an intermittent hematuria. Transferred to urological service and was seen in consultation. The pain soon became that of an intense cystitis which demanded relief by opiates. The urine was deeply pigmented with blood. The general condition of the patient fell off quite rapidly, and in a few days, he developed symptoms of acute pyelitis. The temperature chart showed a slight pus curve. Pain in the bladder and kidney regions became intense and constant. He seemed to be nearing a collapse. No satisfactory explanation could be found to account for this state of affairs.

Cystoscopy on March 31st revealed an atypical and puzzling pathology. The bas-fond was deeply congested. There were areas of small, irregular, shallow ulceration around the ureteral outlets. Numerous greyish white patches appeared on the mucosa. These white areas seemed to be neoplastic in places; they were noticeably raised above the mucosal level, and gave the impression of irregular, brawny papillomata. The bladder was exquisitely sensitive and tolerated instrumentation poorly.

To avoid a possible confusion with advanced tuberculosis, careful checking up for that disease was done. Phthalein function was normal for both kidneys, no pathology revealed by pyelography, and no tubercle bacilli demonstrated in the urine. There were quantities of red cells in the excretion from both kidneys.

The patient was submitted to a calminative regimen for several weeks. Cystoscopy was then repeated. The visual pathology had changed surprisingly. The picture was by no means the same as that observed on the first examination. Some of the ulcers had healed; many of the papillomatous excrescences had disappeared, and others had sprung up in new places. The impression gained was that of an advancing, shifting neoplasm of undetermined nature, a pathology which was at total variance with true papillomata. A true papilloma, either benign or malignant, would not possess these phantom characteristics.

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Operation was advised, and the viscus was opened on April 4th. The growth occupied the entire base and extended to the lateral walls. It took on the appearance of a flat, nodular, non-ulcerating carcinoma. Since both ureters were deeply involved at the vesical junction, and since the kidneys seemed to be implicated in the process of the disease, no attempt was made to eradicate the growth. A section was made for the pathologist, and the bladder drained.

The patient seemed to be considerably relieved from the painful symptoms by his operation. Mackey and others recommend drainage of the bladder by suprapubic opening for the acute symptoms of this disease.

A specimen of the growth was sent to Washington for examination. The following report was returned by Drs. Butler and Harper, of the Naval Medical School: "Papilloma due to schistosoma haematobium (vesical bilharziosis). Section shows schistosoma haematobium in tissues. Epithelial hypertrophy. Eosinophiles. Increase of connective tissue. No definite evidence of malignancy."

It might be said in this connection that eosinophilia is a blood finding in the disease. The present case showed an eosinophile percentage ranging from 4 to 15 per cent.

The patient was put upon intravenous medication with tartar emetic immediately. The dose was ½ grain in the beginning, and was increased in ½ grain advances, as recommended by Christopherson, until 2½ grains was given at a time. The dosage was administered on alternating days. A total of 20 grains was given over a period of forty-one days.

The patient improved very rapidly under this treatment. Blood quickly disappeared from the urine, and in the course of a few days ova were not demonstrable in that fluid.

All symptoms having been relieved, cystoscopy was repeated on June 26th. The following report is noted: "Bladder surface normal. Lesions, previously described, healed."

The patient was discharged on July 10th, with a chart note of "Hospital treatment not further indicated." He has not been seen since. It is inferred that he would have been heard from if further trouble had ensued.

Case Two.—A Greek, male, recently arrived in this country, aged 22 years, presented himself with the complaint of painless, bloody urination.

Past History. No venereal disease. Two years ago experienced a similar attack as the present in his native country. Was treated with some unknown intravenous medication. From that time until the present has noticed no symptoms.

Present History. Unreliable. Speaks no English. The present condition seems to have existed for three or four weeks.

Physical Examination. Negative except for "G-U" tract. The nationality of the patient, the history of a similar attack of painless hematuria in the past, and the information that the trouble had been corrected by intravenous medication, all pointed the finger of suspicion to schistosoma haematobium. A search for the ova was made. The laboratory repeatedly reported that the urine was negative.

At cystoscopy the following findings were noted: The instrument passed with but little pain and no urethral resistance. This was evidence *per se* that the urethra was not involved by a bilharziosis. The findings in this case in this respect were diametrically opposite to those in Case One. In that instance the urethra was involved, and the patient suffered intense pain upon the gentlest instrumental manipulation within it.

Patches of mucosa in the fundus were blanched, and presented irregular areas of thickening and nodulation. Since no active inflammatory process could be noticed in that area, it was assumed that this condition was due to the previous attack. The bladder walls undergo a marked thickening when subjected to the action of schistosoma haematobium, and there is also a generous deposition of fibrous tissue within them. Therefore, we inferred from this that the previous attack was fairly severe.

In the base of the bladder toward the lateral walls there were several active bilharzia nodules. These are rounded areas of elevation above the surface having a yellowish cast, and are surrounded by a narrow red halo of congestion. These nodules bled easily. The outlets of the ureters appeared to be about normal, and catheter specimens revealed no pathology in the kidneys.

The diagnosis of schistosoma haematobium was made upon the cystsoscopic findings, and upon the history.

Two intravenous doses of tartar emetic promptly stopped the bleeding. The patient

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must have been eminently pleased with his condition, or else the effects of the medication were not to his taste, because he returned for no further treatment. It is our confident opinion that he will have further trouble. Two doses of tartar emetic are not regarded to be curative. This patient received but one and one-half grains of the drug. It is thought that about twenty grains are needed to cure.

Suite 818—*Medical Arts Building.*

EMBOLISM OF THE ABDOMINAL AORTA: REPORT OF A CASE.*

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There have been at least 111 cases of embolism and thrombosis of the abdominal aorta collected from medical literature.

Banowitch and Ira summarized the literature in 1928. Welch reported fifty-nine cases in 1899. Hesse in 1921 added thirty-two more cases. Wylde in 1922 reported two cases and was able to collect ninety-two other cases from the literature. Banowitch and Ira collected eleven more cases. They reported five cases of their own, making a total of 110.

Hamilton in 1930 reported one case which was associated with aortic stenosis.

The majority of the cases have been associated with chronic cardiac and vascular diseases. Over 50 per cent have been definitely mitral stenosis with auricular fibrillation. Of the five reports by Banowitch and Ira, all were fibrillating. Four had mitral stenosis and one hypertensive cardio-vascular disease.

I wish to add one case associated with mitral stenosis and auricular fibrillation.

N. D., age 59; male; mate on tug boat; admitted to hospital June 11, 1930.

Past History: Malarial fever when a young man; rheumatism when a young man; insane asylum forty days, twenty years ago, for drinking; several previous admissions to this hospital between April 28, 1929, and April 5, 1930. Diagnoses: Valvular heart disease, mitral stenosis, and embolism, cerebral.

Chief Complaint: "Something like pneumonia coming on."

Present History: Patient received an injury to right chest two months ago as the result of an automobile accident. He received treatment at the Custom House, Norfolk, Va. About ten days ago he had a head and chest cold. Was not confined to bed. Expectorated much greenish-yellow sputum. Had indefinite pain and soreness in right chest and abdomen. There had been several attacks of nausea and vomiting following abdominal pain. Voided once or twice nightly.

Physical Examination: General appearance showed a poorly nourished, restless old man; subject to frequent paroxysms of coughing with expectoration of greenish-yellow sputum. Was muttering to himself. When addressed was mentally alert.

Head and Neck: Essentially negative.

Chest: Was flattened with poor expansion generally. Fremitus was normal. Resonance was diminished generally. No rales were heard.

Heart: The apical impulse was diffuse. At the apex there was a presystolic thrill with a systolic shock. In the fifth interspace the left border dullness extended 10½ cm. from the midline. At the apex there was a presystolic rumble with a rough accentuated first sound. The second pulmonic sound was rough and loud. Rhythm was regular. Blood pressure was 118/90. There was no marked sclerosis of the peripheral vessels.

Abdomen: Liver and spleen were not palpated. No masses. No tenderness.

Inguinal Rings: A small inguinal hernia was present on the right.

The remainder of the physical examination was negative.

Temperature was slightly elevated going to 100.4 at one time.

Urinalysis negative.

Blood: The W. B. C. was 12,000. Blood Wassermann was negative in all antigens. X-ray of the lungs showed a fracture of the seventh rib and chronic bronchitis.

Two days after admission the patient was seen in the afternoon with an irregular pulse and a definite pulse deficit. An electrocardiographic record was characteristic of auricular fibrillation.

The following diagnoses were made:

Mitral Stenosis. Auricular Fibrillation. Fracture Seventh Rib Right.

He was given tincture of digitalis 4 c.c., q. 4. h., for five doses, codeine cough syrup q. 3. h., p. r. n., and morphine when very restless.

On the following two days the patient ap-

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Approved for publication by the Surgeon-General of the U. S. Public Health Service.

peared much better. His cardiac rhythm was restored to normal. The cough was much better and temperature was nearly normal.

June 16, 1930, five days following admission, he called the ward surgeon at 2:25 P. M. He appeared to be in acute shock. He stated that a sudden, unbearable pain had struck him in the lumbar region, middle abdomen, and lower extremities. There was cold sweat over the upper half of his body. Purplish blotches covered the skin from the umbilicus downward. Over this same area there was complete motor loss and sensory paralysis. Blood pressure was 160/80. There was no pulsation in femoral vessels. A diagnosis of embolism of the abdominal aorta was made.

The patient continued to suffer with pain in the lower back, abdomen, and lower extremities. He received some relief by the frequent use of morphine.

The following day he was somewhat more comfortable but was very apprehensive about his condition. Urination was involuntary.

On the second day the abdomen was very tender on pressure. There was an increase in the bluish-purple color of the lower extremities. The lower extremities were very cold. A moderate degree of ileus was present.

Urinalysis showed albumin very positive with numerous coarse granular casts.

R. B. C. 5,680,000. Hbg. 84 per cent. W. B. C. 27,000. Neutrophils 84 per cent. Large Lymphocytes 4 per cent. Small Lymphocytes 12 per cent.

The patient died June 19, 1930, about sixty-seven hours after the onset of the embolic symptoms. At the autopsy the stomach was found to be markedly distended. About one-half of the intestines presented a gangrenous appearance. This was most marked about twelve inches from the proximal end of the jejunum. The abdominal aorta was exposed. Just above the bifurcation was an enlargement which was firm on palpation. On opening the aorta there was found a freely movable embolus 2x1x½ cm. in size. Distal to the embolus were soft thrombi in the iliac and femoral vessels. The heart showed thickened, hardened, stenosed mitral valves with a roughened spot between the leaflets which could have been the original site of the embolus.

It is noted that death occurred five hours less than three days from the onset of the embolic symptoms. Of the cases of Banowitch and Ira, death occurred within two days for two, fourteen and fifteen days, respectively, for two other cases, and in one instance was delayed twenty-nine days after the beginning of the symptoms of occlusion.

The treatment of this case was entirely symptomatic. There are two forms of radical treatment. The less radical consists in attempting to massage the abdominal aorta forcibly enough to express the embolus into a smaller vessel. If successful, amputation of a gangrenous extremity is later necessary. I do not know how successful this method has been. The more radical procedure is aortotomy with removal of the embolus. Hesse reports a successful embolectomy where the operation was performed twelve hours after the onset of the occlusion. Bauer reports a case with the successful removal of the embolus three hours after the onset. Eleven cases of embolectomy with fatal issue are on record.

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ADDISON'S DISEASE IN A NEGRO—REPORT OF A CASE.*

By ROBERT L. KING, M. D.,
and
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Addison,[1] in 1855, was able to report in his excellent monograph eleven cases of the syndrome which has since borne his name. Although endocrine dysfunction has been much in the foreground in recent years, proven cases of Addison's disease appear to be comparatively rare.

This is particularly true among Negroes—a surprising fact in view of the high incidence of tuberculosis in this race. Their natural pigmentation unquestionably makes the diagnosis more difficult and may explain, in part, why relatively few cases have been reported in the literature.

Lemann,[2] in 1926, reported the first case of Addison's disease in a Negro. Two years later Evans[3] recorded three more cases. In 1930 Sala and Jacobi[4] added a fifth case and reviewed the literature of the past forty years.

*Read before the Albemarle County Medical Society, Charlottesville, Va., January 8, 1831.

In three of the five cases the diagnosis was confirmed by post-mortem examination.

The case here reported was studied in the University of Virginia Hospital under observation of the authors.

Case Report

C. G., a colored carpenter, aged 49, was first seen in the Medical Out-Patient Department July 22, 1930. The chief complaint was progressive weakness since a mild attack of "influenza" twenty-one months previously. The additional symptoms were vague joint pains, loss of weight, constipation, intermittent pains in the left chest, and generalized increased pigmentation of the skin. He had been unable to work for three months.

Physical examination revealed a well developed colored man in a fair state of nutrition. The mucous membranes of the mouth were paler than normal; the teeth were in bad condition, and pyorrhea was present. The nasal sinuses transilluminated well, but there was a mucopurulent post-nasal discharge. The chest was normal except for a few subcrepitant râles elicited on the left side above the third rib anteriorly and the fourth dorsal spine posteriorly. Slight tenderness was noted on deep palpation of the abdomen about three inches to the left of the umbilicus. This, however, was unaccompanied by spasm or rigidity. The fingers were clubbed and the nails curved. There was a small tender swelling just above the left wrist on the inner surface of the forearm. The general hue of the skin was mahogany-brown. There was definite increased pigmentation of the face, hands, feet, and abdomen. According to the patient's statement his color had deepened during the present illness. The patient's father, whose skin was light brown, remarked that his son's color formerly resembled his own. The blood pressure was 108/60. Weight 147½ pounds. Hemoglobin 60 per cent (Talquist).

Temperature 99.6° (F). Pulse 96. Respiration 24.

A urinalysis revealed no abnormalities and a blood Wassermann test was negative.

A roentgenogram of the chest revealed no evidence of tuberculosis, but a minor degree of pneumonoconiosis.

The patient was seen in the clinic several times during the subsequent four weeks. No improvement was noted at these visits, and he was treated symptomatically for constipation and joint symptoms which caused him the most concern. Several abscessed teeth were demonstrated, the extraction of which was recommended.

He became very weak the night following removal of the teeth, and vomited several times. From that time on he was bedridden due to rapidly progressing weakness. Vomiting occurred frequently, lasting several days; anorexia became constant; the voice was husky; and at times he was restless and irrational.

On September 17, 1930, he was admitted to a hospital ward. Examination at that time revealed emaciation and dehydration. The skin was loose and flabby, particularly that of the extermities. General pigmentation was more intense than previously noted, and the face, hands, abdomen, and knees were jet black. A patchy deposit of pigment in the skin of the palms and soles of the feet was particularly striking. Muscular weakness was apparent, and the voice husky. Many musical rales were heard over both lungs.

The blood pressure was 88/65, hemoglobin 77 per cent, red blood cells 4,850,000, leucocytes 10,000. Results of the other laboratory studies were without significance.

For the first few days slight improvement was evident after vomiting ceased and fluids were administered. Thereafter, the course was progressively downward, coincident with profound exhaustion, a gradual decline in the blood pressure, and the development of hypostatic pneumonia and uremia. (Blood urea 274 mg. per 100 c.c.). The usual therapeutic procedures were of no avail, and death occurred eight days after admission to the hospital.

A necropsy was performed two and one-half hours after death. There was no rigor, and antemortem warmth was present. The body was that of a normally developed, emaciated colored man of about fifty years of age. The skin of the entire body was black except that of the palms, soles, and soft palate which showed dark patchy pigmentation. Dental caries and pyorrhea were present. The mucous membranes of the mouth were pale. The costal margins were prominent, and the abdomen scaphoid. The shins were bowed anteriorly but smooth.

The appendix was adherent, but otherwise normal. The liver weighed 1,422 grams and

was slightly congested and pale. The spleen weighed 150 grams and presented the picture of acute splenic tumor. The serous membranes, gall-bladder, and bile ducts were apparently normal. The kidneys were congested; the capsules stripped easily; the left weighed 180 grams, and the right 165 grams.

The left suprarenal gland was enlarged, firm and in normal position; on cut section it had the appearance of a homogeneous yellowish-white rounded tumor which was firmly resilient and had a dense fibrous capsule. The cortex and medulla could not be differentiated. The right suprarenal was not found.

The thoracic viscera were in normal position. The apices of both lungs were closely adherent to the chest wall. The upper lobe of the right lung was dark red and contained several small tuberculous nodules. The middle and lower lobes were normal. The hilus nodes were enlarged and anthracotic. In the left upper lobe there was a small unilocular cavity with necrotic walls adjacent to an area of fibrocaseous tuberculosis. The left lower lobe appeared normal.

The heart weighed 308 grams; the epicardial fat was decreased; the myocardium was brown and atrophic. The calibre of the aorta was less than normal. The valves, endocardium, and coronary arteries were normal.

The stomach and intestines were normal.

The urinary bladder was small and the wall thickened.

Microscopic examination of the right lung showed chronic tuberculous inflammation with areas of caseation; the left lung, subpleural chronic tuberculous inflammation, areas of caseation, subjacent hemorrhage, red hepatization, and early tubercle formation.

The left suprarenal revealed encapsulated tuberculous caseation with areas of calcification. No trace of suprarenal parenchyma was found.

The liver cords were atrophic and pigmented; capillary congestion was moderate. The portal radicles were prominent and infiltrated with round cells. A few areas suggested early tuberculous inflammation.

Tubular degeneration was demonstrated in the kidneys. There was an increase in interstitial tissue, diffuse capillary and focal congestion, and numerous areas of proliferation of the glomerular epithelium.

The spleen showed some congestion and hyaline degeneration of the arterioles.

There was brown atrophy of the heart muscle.

The pancreas was normal.

Comment

A review of the literature reveals the rarity of Addison's disease in the Negro; only three other cases have been confirmed by autopsy. In view of the typical clinical symptoms and signs and the tuberculous process in the gland recovered, we consider a report of this case justified.

Increased pigmentation of the skin, a prominent diagnostic feature of Addison's disease, is in the Negro an accentuation of the normal pigment melanin. Our patient was born a mulatto; hence the change in color was much more striking than would be evident in a pure blooded Negro.

Conclusions

A sixth case of Addison's disease in a Negro is here reported complete with autopsy studies; the rare occurrence is emphasized.

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TRACHEOTOMY: OBSERVATIONS OF NINETEEN CASES, ILLUSTRATED WITH LANTERN SLIDES.*

By ELBYRNE G. GILL, M. D., Roanoke, Va.

The term tracheotomy was first suggested by Laurence Heister, in 1768. Up to this time the operation was called laryngotomy and branchotomy. The first specific description of this operation can be traced back to the early Roman times. We are led to believe, however, that the operation was practiced much earlier than that.

Diphtheria had more to do with the development of the operation than any other condition. The first successful tracheotomy for diphtheria is credited to Bretonneau, in 1825,

*Read before the Virginia Society of Otolaryngology and Ophthalmology, in Richmond, May 2, 1931.

although Home is credited with having performed this operation in a case of croup in 1765. Prior to this time opening of the larynx or trachea was carried out principally for foreign bodies and for intense angina. The work of Bretonneau was quickly taken up by others, among whom was his pupil Trousseau. The indications for this operation were apparently not very well defined, for in many of the earlier works one sees tracheotomy advocated for cases of drowning.

The development of this operation constitutes a fascinating chapter in the history of medicine. Tracheotomy is indicated in all cases of obstructive laryngeal dyspnea. The cardinal signs are indrawing at the suprasternal notch, indrawing around the clavicles, indrawing of the intercostal spaces. The symptoms are restlessness, choking and waking as soon as the aid of the voluntary respiratory muscles ceases in falling to sleep. Cyanosis is a dangerously late symptom and may never occur. These signs and symptoms are not present in dyspnea of cardiac or asthmatic origin.

As a therapeutic measure in diseases of the larynx the place of tracheotomy has been thoroughly established. There are no contraindications to tracheotomy for dyspnea.

The question of when to perform a tracheotomy is as important as the operation itself, for if too long delayed tracheotomy may be performed in vain. This has been known for centuries, yet we see cases where the operation is withheld until the patient can no longer react favorably to the opening of the trachea. The storing up of an excess of carbon dioxide in the blood and the gradual loss of oxygen from the blood and tissues soon bring the patient to a state where his respiratory center can no longer react.

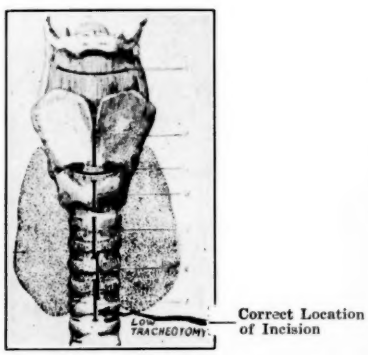

Fig. 1.—Shows location for low tracheotomy.

Anesthesia.—Local infiltration of novocain 1 per cent along the line of incision. Never use general anesthesia.

Technic.—A midline incision dividing the skin and fascia is made from the thyroid notch

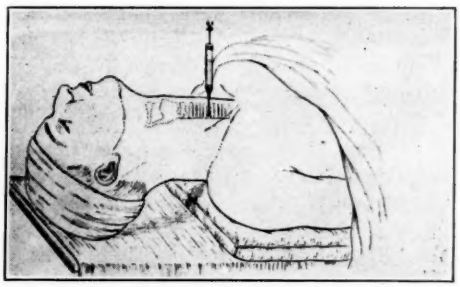

Fig. 2.—Shows correct position for tracheotomy.

to just above the suprasternal notch. The cricoid is located and the deeper dissection is continued from below this point. The incision should be through the *third*, *fourth* and *fifth* tracheal rings.

Size of Tube.—A tube should not be used if it is larger than one-half the diameter of the trachea. This allows the patient to breathe around the tube and makes decannulation much easier.

The introduction of the bronchoscope is a valuable aid, particularly if you do not have assistance. It gives a definite firm landmark,

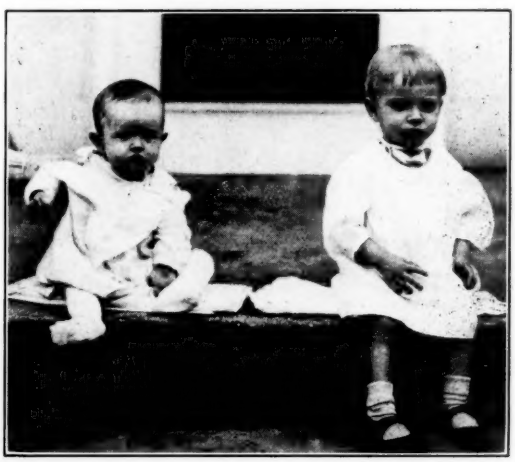

Fig. 3.—Shows three-months-old child with congental stenosis and a two-year-old child with multiple papillomata of the larynx.

STATISTICAL CHART SHOWING INDICATIONS AND RESULTS OF THE NINETEEN TRACHEOTOMY CASES.

AGE	SEX	SYMPTOMS DURATION	DIAGNOSIS	OPERATION LOCAL GENERAL	SIZE TRACHEOTOMY TUBE	LENGTH OF TIME TUBE WORN	COMPLICATIONS	RESULTS	INITIALS
5 yrs	M	Difficult breathing	Laryngeal diphtheria	Local	No. 1	4 days	None	Recovery	A. F.
5 yrs	F	Difficult breathing	Laryngeal edema	Local	No. 1	5 days	None	Recovery	I. H.
3 yrs	M	Laryngeal dyspnea following bronchoscopy.	Foreign body in bronchus; obstructive laryngeal dyspnea.	Local	No. 1	10 days	None	Recovery	T. R.
13 mo	F	Difficult breathing cyanosis and dyspnea for 48 hours.	Foreign body in bronchus; obstructive laryngeal dyspnea following foreign body aspiration.	Local	No. 1	10 days	Massive atelectasis right lung.	Recovery	E. S.
2 yrs	M	Laryngeal dyspnea	Laryngeal diphtheria.	Local	No. 1	16 months	Laryngeal stenosis	Recovery	J. D. C.
19 yrs	M	Dyspnea	Paralysis of vocal cords following thyroidectomy	Local	No. 3	6 months	Tracheitis	Death elsewhere cause unkown	U.
2 yrs	M	Laryngeal dyspnea 3 days.	Laryngeal diphtheria	Local	No. 1	2½ hours	Laryngeal diphtheria, tracheo bronchitis.	Death	J. D.
19 mo	M	Laryngeal dyspnea	Foreign body in left bronchus.	Local	No. 1	15 days	Atelectasis of left lung.	Recovery	J. D. T.
2 yrs	M	Difficult breathing, 3 weeks.	Papillomata of larynx	Local	No. 1	Approximately 1 year.	Had been treated for diphtheria. Difficult breathing; 3 weeks.	Death at home cauesd by papilloma extending in trachea below tube.	E. Mc.
13 mo	F	Difficult breathing for 5 weeks.	Congenital stenosis of larynx.	Local	No. 1	16 months.	Congenital stenosis of larynx.	Recovery	C. P.
2 yrs	M	Difficult breathing, coughing and choking for 5 months.	Lung abscess.	Local	No. 1	8 days	Gangrene of lung.	Death caused by gangrene of lung.	R. J.
3 yrs	M	Wheezy breathing and coughing for 2 weeks.	Portion of safety pin in right main bronchus.	Local	No. 1	3 days	None	Recovery	W. V.
16 mo	M	Intermittent dyspnea; 12 hrs.	Foreign body in trachea.	Local	No. 1	3 days	None	Recovery	W. M.

STATISTICAL CHART—*Continued*

AGE	SEX	SYMPTOMS DURATION	DIAGNOSIS	OPERATION LOCAL GENERAL	SIZE TRACHEOTOMY TUBE	LENGTH OF TIME TUBE WORN	COMPLICATIONS	RESULTS	INITIALS
2 yrs	F	Extreme dyspnea	Laryngeal diphtheria	Local	No. 1	10 days	None	Recovery	G. K.
2 yrs	F	Extreme dyspnea	Foreign body in trachea	Local	No. 1	3 days	None	Recovery	S. B.
12 yrs	M	Coughing and choking for 48 hours.	Foreign body in left bronchus.	Local	No. 2	2 days	None	Recovery	D. H.
2 yrs	M	Extreme dyspnea for 10 days.	Foreign body in bronchus.	Local	No. 1	3 days	None	Recovery	D. W.
2 yrs	M	Dyspnea for 2 hours.	Foreign body in larynx.	Local	No. 1	2 days	None	Recovery	B. P.
3 yrs	M	Laryngeal dyspnea 1 week.	Laryngeal diphtheria	Local	No. 1	4 days	None	Recovery	C. S.

also provides breathing space and prevents the aspiration of blood into the bronchus. When the bronchoscope is passed, however, the operation of tracheotomy is greatly simplified, for an emergency procedure has then been transformed into a deliberate one.

AFTER CARE.—The inner tube must be changed as often as is necessary to be kept clean. The tracheotomy patient cannot talk and should never be left alone. A tracheotomy set with duplicate tubes should be kept in the patient's room. The outer tube should be changed every day.

DECANNULATION.—The tube should be worn until the patient can sleep at least three nights with tube tightly corked.

COMPLICATIONS.—Pneumonia and edema of the lungs are exceedingly rare. Subcutaneous emphysema may occur and is of no consequence unless the wound has been stitched.

The indications for tracheotomy in this series of cases are as follows:

Obstructive laryngeal diphtheria, five cases.

Obstructive laryngeal dyspnea caused by foreign body, six cases.

Dyspnea following bronchoscopy, two cases.

Laryngeal edema following scarlet fever, one case.

Complete paralysis of vocal cords, one case.

Congenital stenosis of larynx, one case.

Papillomata of larynx, one case.

For removal of foreign bodies, two cases.

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FRACTURES.*

By M. H. TODD, M. D., F. A. C. S., Norfolk, Va.

You are all perfectly familiar with the usual teachings in regard to fractures; and I shall assume that you have this knowledge, and confine myself in this paper to comments drawn from my own experience.

You must know, in the first place, that I belong to the strictly modern school, the younger generation, in this field. Nearly all of my eighteen years' experience in this line

*Read before the Southside Virginia Medical Society, at South Hill, Va., June 9, 1931.

has been during and since the World War; and all of my work has been in hospitals with full X-ray and operative equipment and staff. I speak, therefore, from a particular kind of experience, especially suited to obtaining good results if they could in reason be obtained. I have had none of the difficulties, often insuperable, that are met with by the general practitioner.

Further still, I have been able to follow end-results for months or for years, and, indeed, have been compelled to follow them, either in the Army, or by the operation of the compensation laws. It is, therefore, from this particular viewpoint that I write the present paper.

There are certain traditions that I wish to mention, in order that I may differ with them.

First, the traditional feeling that it indicates a lack of diagnostic ability, to rely on the X-ray. It was taught for years that a really competent surgeon should rather scorn the aid of the X-ray in making his diagnosis, even when the X-ray was easily available. I have never understood this notion; for, in the first place, there is no one who has not been occasionally surprised when he saw the X-ray of some fracture which he was certain he had diagnosed completely, and was forced to note how different it really was. Secondly, why rely on blind touch when we can use our eyes?

The X-ray enables us to see broken bones, not merely try to feel them through the muscles; and it is purely absurd to deny that the sense of sight is by all odds our most reliable guide in the diagnosis.

I will readily grant that the X-ray may, in the first place, show a distorted view of the break; and, in the second place, it may at first fail to show a fracture when it really exists. I have before now been compelled to postpone a diagnosis until callus actually appeared, as in some fractures of the pelvis; and I have sent a man back to work with a fracture of as easily visualized a bone as a metatarsal, unrecognized on the first film, only to discover the next day that he had not only fracture, but gross displacement, when another film was made.

But such cases are rare; practically always the X-ray gives a very accurate and dependable idea of the actual lesion, and, by comparison, any other method of diagnosis is clumsy and inaccurate.

The second tradition I wish to speak of relates to crepitus; and to say that, in all my experience I have never but two or three times deliberately elicited this sign. I cannot imagine a generally more needless and likely harmful procedure; for it can only be done by causing displacement where none discernible existed before. Why hurt the patient and displace his fracture by such a maneuvre? I formerly had an assistant, trained under the old regime, who could never be satisfied, no matter how obvious the deformity, until he had also obtained good vigorous crepitus by rubbing the patient's bones together. It set my nerves on edge, to say nothing of the patient's.

Again, the tradition of waiting until swelling subsides before reducing the break. The simple fact is that the sooner a fracture is reduced, the less by far will be the swelling.

Another tradition is that healing of fractures takes place in six or eight weeks. This is true only in fractures of the smallest bones, as in children; and it must be recognized that full use of an extremity can be permitted only after a much longer time. If a fractured leg is able to stand the strain of actual work after a period of four months, it may be considered to have healed well. And, in this regard, I wish to state that the follow-up X-ray is the only dependable guide to be used. Many a case of deformity has occurred late after a fracture, because of the too early resumption of full function. The X-ray picks out such cases at once, clearly showing the soft and incomplete union; and follow-up films should never be omitted.

Another tradition that disturbs me is the idea that fractures of the leg and thigh are expected to heal with shortening and some deformity. It is true that certain fractures, oblique or comminuted, will heal with a little shortening; but it need be very little indeed—hardly definitely measurable. In square breaks, shortening should not occur at all, for this means actual over-lapping of the whole bone. Further, in any case, there should be no angulation, even granting a little overriding of oblique fractures; for a change in the line of axis of a weight-bearing bone is a serious thing which may later lead to pronounced static troubles.

The final tradition that I wish to mention is this one, that in compound fractures, such as gunshot wounds, the thing to do is to put in a little drain, or plug, of iodoform gauze.

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I feel apologetic at even mentioning this one, but patients have been sent to me in this manner, more than once. Such a procedure, of course, almost guarantees that infection will occur.

Treatment

Having thus registered objection to certain traditions, I wish for a moment to refer to the question of treatment, and to commend the othopedic point of view in this regard. My training has been more in surgery than in orthopedics; but I have been fortunate in training under some very good orthopedists from time to time, and have learned from them the supreme importance of function. A surgeon may chiefly consider the healing of the broken bone; the orthopedist considers the use of the whole member afterward.

I illustrate this matter by referring to the sad cases that I saw in England during the war, of men whose compound fractures of the humerus had been painstakingly made to heal and unite, but whose hands had been retained in splints until they no longer had any useful motion in the fingers; and I watched such cases given vigorous physio-therapy for months, with depressingly little benefit.

It is nothing less than a crime to keep a hand splinted for weeks with the fingers bandaged straight out on a board; yet such splintage is still too often described, and used. It is imperative to recognize that finger motion is very easily lost, and often it is never regained.

It is a similar crime to allow drop-foot and hallux rigidus to occur, as they may do after fractures of the leg.

I do not approve of the radical school that seems to teach motion in disregard of the position of the fracture; but I do know that after a fracture has stuck together, the question of massage and motion are most important. This is especially true of the fractures of the forearm, including the familiar Colles' fracture.

Having spoken of the supreme importance of function, I wish now to make a plea for as nearly an anatomical reduction as can reasonably be obtained under the circumstances; for eventual function is unquestionably much better.

It is necessary to recognize that certain fractures can perfectly well be cared for in the office, or at the patient's home; while others, because of difficulty in maintaining reduction or from injury to soft parts, can only be treated in the hospital if good results are to be obtained. Fractures of the femur, and compound fractures, should always be classed in this latter group; and the patient should be clearly told that, unless he consents to permit your treatment under these good conditions, the result cannot be as good as it should be.

Most fractures will remain in reasonably good position with ordinary external splintage, casts, and so forth; some require skeletal traction; and good reduction can only be attained in some by open reduction and plating.

The proportion of cases in which I found it wise to plate, in a recent series of five hundred cases of injury to the leg, was less than 10 per cent. Some sort of results could have been attained without this procedure; but only very imperfect ones, compared with the rapidity and certainty of normal healing and function after this operation. The technique of the operation is simple, but exacting; union is speedy and sound, and in suitable cases the results are very far superior to any other method of treatment. I shall not enter here into operative details, but wish to say that exacting technique is imperative.

It is always necessary, in treating any fracture, to remember the injury to the soft parts as well as that of the bone; too much swelling under the deep fascia, from arterial extravasation, may result in Volkmann's contracture or in gangrene; and more than one death from fracture may be laid to this cause. The treatment, imperative when needed, is incision through the deep fascia and relief of tension.

I wish to call attention to the need for supervising fractures during the healing stage; for if they are simply put in casts and let alone, strange things will often happen to the perfectly good reduction you have primarily attained. The soft parts will atrophy and shrink away, and the bones will sag, and, in the end, there will be notable deformity and imperfect usefulness even in the simplest fractures. This is particularly true near the ankle, where the pull of the Achilles tendon is another factor in causing angulation; and it is notoriously true of fractures of the femur, as you are undoubtedly all aware.

In the convalescent stage, physio-therapy is very important; and of even greater importance is the actual functional use of the injured member; preferably not in tedious gymnastics,

but in performing some sort of light work, preferably of an interesting nature,—in brief, occupational therapy. If the employer can create a light job requiring some use of the part, it is vastly the best method of convalescent therapy, and will work miracles in shortening the period of disability and reducing final impairment.

SUMMARY

In treating fractures, good alignment must be obtained; and, as nearly as possible, correct position. The X-ray should be at hand, if possible, and a confirming film should be taken after reduction. This is elementary but often is not done even when the X-ray is available; and only imperfect reduction is the result.

Splintage, especially casts, should be carefully watched for twenty-four hours, and the limb should be highly elevated. It is wise, if in doubt, to split the cast to allow for swelling, though it is not my practice in hospital cases.

Always allow motion of the fingers at the earliest possible moment; do not bandage them out on a board, or they will certainly stiffen.

In compound fractures, hospital treatment and trained surgical judgment will represent the difference betweeen good recovery, on the one hand, and disaster, amputation or even death, on the other.

Active use of the member, when convalescent, is the quickest way of restoring function.

Certain traditions are incorrect, and should be discarded.

Lastly, I write this paper from the viewpoint of a nearly ideal experience as far as equipment and facilities are concerned. The conclusions I have drawn cannot always be applied, I am well aware, in general practice, but I wish to emphasize them where they are possible.

712 *Botetourt Street.*

PREMATURE DELIVERY AND DEATH OF THE FETUS IN SEVERAL CONSECUTIVE PREGNANCIES IN THE SAME WOMAN: CASE REPORT.

By JULIAN M. HOWE, M. D., Washington, D. C.

Has the frequent occurrence of premature deliveries and abortions become so commonplace that we accept them as an established fact of nature about which little in a constructive way to prevent them can be done?

The authors on syphilis and nephritis believe these to be the two main causes of premature birth. Every woman who has a child by a syphilitic husband has a positive blood Wassermann. The old theory of a man transmitting the disease to his child without the mother becoming infected is no longer tenable. The placenta will generally be larger in these cases, and the fetus will show the characteristic syphilitic changes, sometimes even containing spirochete. Generally in cases of repeated abortion, all the information gathered at subsequent abortions will be that the placenta has been large and the amniotic fluid more copious than normal.

Many women with nephritis will pass through pregnancy without much disturbance, but in many, uremic intoxication will occur, headaches, disturbances of vision, vomiting, deafness, epistaxis, albuminuria and edema. The influence of nephritis upon the placenta by small or larger hemorrhages may cause infarction, and the child may die. The placental hemorrhages are dependent upon the condition of the kidney.

Pathologic factors, such as endometritis and metritis, as residuals of septic parturition, as focal infection, teeth, tonsils, sinuses, and one case reported by Curtis, where the husband's apical abscesses were the foci, result in an irritable musculature and a tendency to abortion.

Characteristic changes were noted in accordance with the period of the cycle in the physiology of menstruation, estrus, and parturition; as worked out by Allen and Doisy, Novak, Dixon and Marshall, Long and Evans, and many other investigators. In conjunction with this, vaginal smears, changes in the mammae, vagina and uterus were taken as criteria for the study of the sex hormones, using immature and spayed white rats for this work. Later, this investigation was expanded by determination of the sex hormone concentration of human blood, and the examination of human follicles, corpora lutea and placental tissue obtained from living patients. It was found that the normal sex cycle in primates begins ten to fifteen days after menstruation with ovulation and ends after delivery and involution. The menstrual cycle, therefore, is an abortive mechanism only.

The corpus luteum exerts a regulatory control, since during its presence and activity, the

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oxytocic effect of the pituitary secretion of uterine muscle is held in abeyance, but upon its beginning degeneration, the uterine contraction occurs. This explains the periodicity of menstruation and parturition.

The gestational hormone does not have a species specificity, but is identical in lower mammals and primates alike. It is active only as a lipoidal extract, and its activity varies inversely in proportion to the amount of cholesterol present. The water soluble extracts are nearly inactive, as clinical experience teaches. The potency of the lipoidal extracts is measured in rat units; one unit being the minimum amount of the extract necessary to produce the characteristic changes in a spayed white rat.

In the study of spontaneous abortion in the light of these findings, we note that abortion occurs most frequently at the time of the regular menstrual cycle when we would expect the corpus luteum to show its degenerate changes, allowing the pituitary to stimulate the uterine muscle. If, in addition, there is an irritable muscle present, uterine contractions are much more liable to occur. Again corpus luteum would show its degenerative changes earlier than in others. This might be brought about by previous traumatic or toxemic abortion, with the formation of a tendency toward early degenerative change, or it might be merely an individual peculiarity. Conversely, in the presence of such conditions, it might reasonably be expected that the supplying of potent luteal extract would inhibit the pituitary action, and prevent abortion. This view is supported by the findings of Pearl and Surface and Kennedy, who show that injections of corpus luteum inhibit ovulation in fowls and rabbits and that ovulation begins on cessation of the injections.

Uterine contractions of parturition, whether premature or mature, as well as the rhythmic contractions at menstruation, must inevitably depend on a delicate balance between the hormones of the pituitary and of the corpus luteum and placenta. While the gestational hormone is preponderant, the pregnancy proceeds with no contractions. During the latter days or weeks of pregnancy, especially in multiparae, uterine contractions are increasingly noticed. In many cases contractions are noted at each recurring menstrual cycle, and the patient must take great care lest abortion occur, while in some cases the abortion repeatedly occurs. In these cases, if our logic is sound, the corpus luteum is in varying stages of degeneration, and the hormone is insufficient fully to control the pituitary hormone; so the uterine irritability is increased. In those cases where there is hyper-irritability of the muscle due to chronic infection or other causes, the pituitary preponderance need be very slight to result in abortion.

Malformations and malposition of the uterus, extensive lacerations, new growths, and also emotional upsets of which fright is the commonest, may render the uterus incapable of harboring the growing fetus.

The case I wish to report is that of a married white woman, thirty-five years of age, who gave history of eight premature labors—six were born dead, one lived for a few minutes, and one for several hours after delivery.

Family history was negative except maternal grandmother, who died from heart trouble and kidney disease.

Personal history: Has had usual diseases of childhood, infantile paralysis at twelve years of age, which left a slight deformity of right forearm and hand, influenza at twenty-two years of age with normal convalescence.

This woman was well developed with rather large bones, fair skin, light hair and blue eyes. The muscles of the right forearm and hand were smaller than those of the left, and there was noticeable difficulty in extending the fingers. Pelvic examination revealed the vaginal outlet to be normal; uterus, tubes, and ovaries were also normal in size and position, and not tender to the palpating hand. Physical examination, otherwise, was not remarkable. Wassermann reaction negative. Urine examination negative.

In the spring of 1928, she again became pregnant. Glandular therapy was begun at about the second month and she was given an ampoule of corpus luteum intramuscularly every week up to the sixth month. It then became inconvenient for her to come to the office and one five grain tablet of corpus luteum was given by mouth three times a day. She was advised to take extreme care in her daily habits and to exercise moderately.

At seven months and two weeks' gestation, a gush of blood, followed by continued bleeding, sent the patient to the hospital where a partial placenta previa was noted upon exami-

nation. The cervix was partially dilated so that by breech extraction, a baby boy was delivered, who is still alive and well. I believe that the possible changes in the uterine muscles, following infantile paralysis and lack of proper glandular functions were responsible for these premature labors and foetal deaths, and that the administration of glandular therapy or the pathological premature delivery was responsible for this living child.

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1309 *Rhode Island Avenue, Northwest.*

GALL-BLADDER DRAINAGE BY DUODENAL INTUBATION.*

By VERNE S. CAVINESS, M. D., F. A. C. P., Raleigh, N. C.

HISTORICAL

Following the original work of Einhorn and Meltzer demonstrating the possibility of duodenal intubation, B. B. Vincent Lyon, of Philadelphia, began an investigation of the clinical potentialities of such a procedure, especially for gall-bladder drainage.

Lyon demonstrated that there are three types of bile obtainable by duodenal drainage, viz.; A, B, and C bile. He also has developed a practical technic for drainage.

Martin E. Rehfuss, of Philadelphia, has also done a great deal of investigative work. It now seems to be definitely established that gall-bladder drainage by duodenal intubation has a definite place in medicine for diagnosis and also for therapy in selected cases.

INDICATIONS AND CONTRAINDICATIONS

Conservatism is highly important in the use of duodenal intubation. A correct diagnosis may not be made without careful correlation of all available clinical data with the findings in the bile removed by drainage, nor may a cure be expected in all cases of gall-bladder disease treated by this method.

Cholecystitis and cholangitis often yield readily to treatment by duodenal intubation, but even in these cases, failures occur occasionally. Acute cholecystitis yields much more readily than chronic cholecystitis, but in chronic cases very satisfactory results are often obtained.

Cholangitis, with or without acute catarrhal jaundice, yields to duodenal drainage more readily than cholecystitis. In general, while several drainages may be required before any signs of improvement are noted, recovery usually follows a few treatments.

Cholelithiasis and empyema are definitely surgical conditions, and very little is to be expected from duodenal intubation,—either diagnostic or therapeutic.

At times, a small stone producing an obstructive jaundice can be dislodged by duodenal intubation and the jaundice relieved. However, in general, cholelithiasis and empyema of the gall-bladder may be regarded as belonging strictly within the realm of surgery.

In the field of diagnosis, duodenal intubation serves a useful purpose in determining the type of bile recovered and the identity of the infecting organism.

A bile, which is secured first, is very small in amount, being only about the 10 c.c. the common and cystic ducts can contain. From a diagnostic standpoint, it is of very little value. B bile comes from the gall-bladder where it has been concentrated about 10-1 and has mucus mixed with it. It is dark in color and its cytological and bacterial examinations indicate the probable condition in the gall-bladder. C bile comes directly from the hepatic ducts. It is very thin and pale yellow in color.

TECHNIC

Swallowing the Tube. Any duodenal tube with a tip of any type may be used. The patient may be in any comfortable position.

The only preparation of the patient that is necessary is a fasting stomach. If desired, atropine sulphate gr. 1/100 may be given, either by mouth or hypodermically, one hour before passing the tube. The pharynx may be sprayed with 5 per cent procain solution if it is too irritable for the patient to swallow the tube.

The patient swallows the tube to the first (40 cm.) mark. If necessary, a stylette may be used. The patient should then lie on the right side and swallow 1 cm. of the tube every few minutes until about 65 to 75 cm. of the tube, depending on the size of the patient, has been swallowed. If the tip does not pass the pylorus during this procedure, it probably will pass within a few minutes.

*Read before the Wake County Medical Society, September 13, 1928, and before the Wilson County Medical Society, September 10, 1930.

The patient should lie on the right side until the flow of bile is definitely established.

Proof That the Tube Is in the Duodenum. Except in obstructive jaundice, it is easy to demonstrate that the tip is in the duodenum. So soon as the olivary tip reaches the ampulla of Vater, a flow of A bile, undiluted by gastric secretion, is likely to begin.

In case there is no flow of bile, but it is thought that the tip is in the duodenum, there are several methods by which its location can be determined.

One method consists of making gentle traction on the tube; if the tip be in the duodenum, a tugging on the lower end of the tube should be felt.

If the gastric content was acid, the secretions thought to be from the duodenum, should be alkaline.

Air injected through the tube gives a gurgling sound when heard through the stethoscope on the abdominal wall. If the tip be in the duodenum, the sounds will have a higher pitch than if in the stomach.

A fluoroscopic examination is often useful in determining the location and position of the tube and tip; however, this is rarely, if ever, necessary except with workers who are inexperienced.

A good flow of undiluted bile is the best proof that the tip is in the duodenum.

Drainage. Unless there be a complete obstruction of the common or hepatic ducts, so soon as the olivary tip reaches the ampulla of Vater and causes a relaxation of the sphincter Oddi, bile is likely to begin flowing.

Drainage should be secured by the siphon method rather than by syringes or aspiration bottles. If too much suction be applied, only harm can occur. If bile can get into the duodenum, it can easily be siphoned out through a tube.

In case the flow of bile does not begin within a short time after the olivary tip is at the ampulla of Vater, a few cubic centimeters of air injected through the tube will often serve as ample stimulus to start the flow.

Various solutions are often effective to start a flow when injected through the tube. Magnesium sulphate is used more extensively than any other solution. However, sodium sulphate, sodium chloride, sodium bicarbonate, peptone solution, sodium phosphate, citrate of magnesia, 2/10 per cent hydrochloric acid and many other substances have been used and found effective. Apparently, all these substances act by relaxing and relieving congestion in the inflamed mucus membrane of biliary ducts.

Cultures should be obtained under as aseptic conditions as possible. They may be collected either before or after injecting magnesium sulphate, and after injecting some of the other solutions commonly used; in general, it is probably preferable, whenever possible, to collect bile for cultures before making injections. Bile, itself, is a good culture medium and, if kept at about 37° C., need not necessarily be transferred to other culture media for some hours.

Drainage should be continued so long as A and B bile are obtained and until C bile flows freely.

Therapeutic Results

When gall-bladder drainage is used for diagnostic purposes, very little, if any, therapeutic result is to be expected.

In simple catarrhal jaundice, from one to three or four drainages may be expected to yield a good flow of bile, affording a rapid recovery from jaundice.

Chronic catarrhal cholecystitis is at times considered to be a surgical condition, and, by means of surgery, good therapeutic results may be obtained. However, in chonic cholecystitis, if for any reason surgery is not applicable, duodenal intubation can be made to give very satisfactory results if drainage be performed properly and repeated sufficiently often.

In acute cholecystitis several drainages are likely to be necessary. A single drainage often affords immediate relief, but unless the treatment is repeated within a few days, the symptoms are likely to become aggravated. It is probable that in a majority of cases a complete cure can be effected by this means of treatment.

In the treatment of infection of the biliary passages it is impossible to rely on any one method of treatment. There are many things that must be considered. Prime among these should be mentioned the source of the infection. Unless the source of the infection is removed, reinfection will be prompt. The general hygiene of the patient must receive careful attention. Elimination, diet, and habits of life, all play an important part and must

be corrected and adjusted to meet the needs of the individual case.

Outlook

Bacterial cultures from B bile may show no growth. Concentrated bile inhibits bacterial growth. Growth is obtained from B bile which is thin and has not been concentrated. It may contain tinges of blood and often is slightly purulent in character.

The organisms most often found are bacillus coli, staphylococci, and a specific strain of streptococcus which appears to attack the gall-bladder whenever present in the body. Also Vincent's organisms, typhoid bacilli, influenza bacilli, amoebae, streptococci, especially the hemolytic strain, pneumococci, micrococcus melitensis, bacillus pyocyaneus, bacillus enteritidis, Vibrio cholerae Asiaticae, and tubercle bacilli, are causative at times.

Autogenous vaccines, made from cultures of B bile obtained by duodenal intubation, give excellent results in many types of infection. Stock vaccines are not so satisfactory.

An increase in cholesterol crystals in bile associated with an increase in blood cholesterol is very suggestive of gall-stones, either present, being formed or about to be formed. From a therapeutic standpoint, such information is of very little value, its value resting on the side of diagnosis.

Conclusions

Extensive studies and research have demonstrated the value of gall-bladder drainage in selected cases:

1. For diagnostic purposes.
2. Therapeutic—
   (a) In simple acute catarrhal jaundice.
   (b) In cholangitis.
   (c) In chronic catarrhal cholecystitis.
   (d) Occasionally in cholelithiasis.

818 *Professional Building.*

INVERSION OF THE UTERUS: REPORT OF A CASE.

By J. M. WHITFIELD, M. D., Richmond, Va.

Inversion of the uterus is a rare and serious complication of labor, coming on immediately after delivery or sometime later, its occurrence having been delayed as late as the fifth day. Concerning the incidence of the condition one is impressed at the wide variation quoted by different authors. Williams quotes results of two writers who state the condition as having occurred once in 250,000 and once in 191,000 deliveries. It is probable that many obstetricians have never seen a case or have met with only a few examples of this complication. However, inversion is without doubt more common in the practice of ignorant midwives than one would believe from the figures given above.

The inverted uterus has been aptly described as "upside down and inside out." In its production many causative factors have been enumerated, among these being forcible expression, manual removal of the placenta, traction of the cord, etc., but many authors believe that its spontaneous production is quite as frequent as when these extraneous factors are concerned. Indeed, it is hard to account for the accident unless we assume faulty enervation or thin walled uterus with fundal attachment of the placenta.

The symptoms of the condition may be most alarming, with shock and profuse hemorrhage, followed quickly by a rapid exodus. Here again the picture may vary markedly and present few if any unfavorable omens until later, or the condition may become chronic and necessitate "later operative procedures." As would be expected the prognosis is dependent upon the symptomatology and treatment given. Conservatism is here absolutely necessary in the proper management of the case, any and all operative measures being contraindicated in the presence of severe shock which only too frequently supervenes. There are those cases, however, which may and should have prompt replacement or other surgical means employed. We find the mortality as quoted variously between 14 and 25 per cent but these figures can hardly represent the much more grave outlook ahead of the unfortunate woman in unsuitable surroundings and dependent upon ignorant and unskilled attendants.

The patient Mrs. R. G., entered the obstetrical service of a local hospital February 18, 1931. She was seen by me two hours later and the following data secured. The patient was a married woman of twenty-two years, in labor, had had no previous pregnancy, and was apparently in fair condition except that the pulse rate was rapid (140). She stated that her pains had started on the preceding day (about 9:00 A. M.) and had continued until her doctor had advised her to come to the

hospital. Her pains were, and had been, of very poor quality. Examination at this time showed the fetal heart to be good, the blood pressure was normal and a rectal examination revealed the cervix to be only very slightly dilated. As the patient was doing well except that she was fatigued out of proportion to the time in labor and type of uterine contractions she was having, I ordered that she be given small doses of morphine and hyoscine and that proctoclysis of 5 per cent glucose be started.

During the rest of the afternoon and night following she rested nicely between uterine contractions which continued to be ineffectual and of very poor quality. Accordingly, on the following morning when it was found that practically no progress had been made, I determined to attempt delivery as soon as possible. A No. 5 Voorhees bag was inserted and weighted. We were agreeably surprised to have the bag expelled in about thirty minutes and a vaginal examination now showed the head still high in the pelvis with the uterus almost in a tetanic condition. A version was attempted under deep ether anesthesia but it was found necessary to give 1 c.c. of adrenalin before this could be accomplished. The extraction was somewhat difficult and forceps were applied to the aftercoming head. The baby now appeared to be in good condition and promptly started to breathe.

We now waited about thirty minutes for the delivery of the placenta. There was no bleeding and as the placenta did not seem to be forthcoming we proceeded to repair the episiotomy done before the delivery. After completing this, as the uterus was quite relaxed, a small dose of pituitrin was given and the uterus was very gently massaged. For a minute or two I could scarcely palpate the uterus and then a contraction seemed to be starting. The uterus now became hard in my grasp and suddenly disappeared from the abdominal cavity, as a large mass with the placenta attached protruded from the vagina. The condition was immediately recognized, the placenta was detached with difficulty as it was somewhat adherent, and I attempted to replace the uterus. This could not be done until ether was again started and the patient slightly relaxed. After putting the uterus back in place, a tight uterine pack was introduced to control the now rather free hemorrhage and she was returned to bed in very satisfactory condition. The packing was removed in twelve hours and the patient made an uneventful recovery, her temperature being within normal limits continuously save on the third day when it reached 101 F. and then dropped again to normal.

A vaginal examination done on the eleventh day after delivery showed her condition as good, the uterus being freely movable, anteflexed, and involuting properly, with the cervix intact. On the following day patient was discharged from the hospital with her baby, both in good condition. As the patient resides in a nearby city I have been unable to get her to come back for the customary check up at six weeks, but so far as I know she is and has been doing well.

Professional Building.

ANEURYSM OF THE AORTA.*

By JOSEPH F. ELWARD, M. D., Washington, D. C.

Aneurysm of the aorta occurs frequently enough not to excite great comment. The case here reported presents more or less unusual complications. It is deemed worthy of a place in the literature.

Case Report

C. McC., white, male, aged 48. Occupation, tin and sheet metal worker. Weight 130 pounds.

Physical examination by Dr. John J. Lynch.

Family History irrelevant.

Past History: Usual diseases of childhood. Influenza 1918. Venereal history denied. Has always been well and able to follow occupation of sheet metal worker.

Present Illness: November, 1929, developed a cough with dyspnea on exertion, began to lose weight, had sweats, felt feverish at times, usually late in the day. Voice became husky. Some feeling of oppression in chest, but no pain, raises thick sputum.

Physical Examination: Well developed, poorly nourished white male, weight 130. Eyes, ears negative, nose deviated septum. Throat, tongue coated, teeth poor. Tonsils small and deeply imbedded, no pus. No pulsations in the neck. Chest expands equally on both sides, with possibly a slight lag on left. Heart showed no palpatory thrills, apex beat in fifth interspace in nipple line. Percussion dullness increased to the left. No murmurs nor bruit

*Read before the Washington Medical and Surgical Society, March 23, 1931.

are heard. Lungs impaired resonance in left lower lobe. Large bubbling rales are heard in left lower. Referred for examination by laryngologist and roentgen study of the chest.

Nose and throat examination by Dr. James H. Earley.

Ears: Negative.

Nose: Marked deviation of the septum to the left. No pus noted in either nostril.

Sinuses: Transillumination of the sinuses negative.

Mouth: Tongue coated. Teeth poor.

Throat: Tonsils small, buried and pus cannot be expressed. No post-nasal discharge noted.

Larynx: Cords not inflamed, but slight posterior thickening. No ulceration or tumors of the cords noted. Trachea negative.

Impression: Believe that signs and symptoms of this patient not laryngeal in type and believe that there must be some pathology in the chest like that of a foreign body or partial obstruction below the larynx.

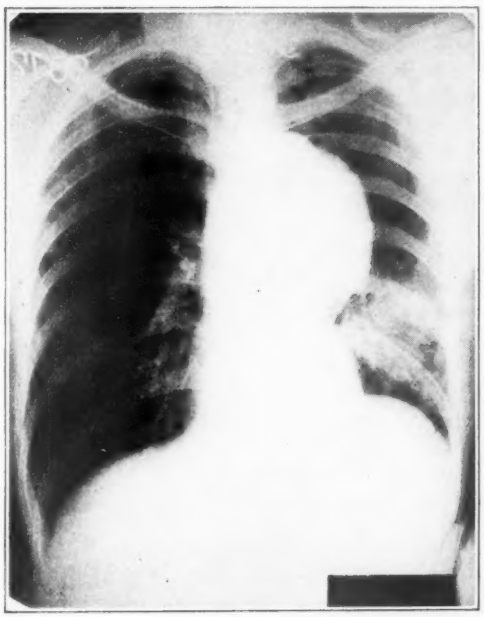
Diagnosis: Larynx negative. Deviated septum.

Fluoroscopic and Radiostereoscopic Study of the Chest shows the following: Fluoroscopic examination of the chest shows the right diaphragmatic excursion wider than normal. The left diaphragmatic excursion is not as great as on the right and is markedly sluggish. The heart is small and beats rather rapidly.

The diaphragmatic movements are reversed, i. e., as the right diaphragm descends, the left ascends. The aortic shadow is considerably widened. A definite sacculation is noted at the arch and descending aorta. The lung fields are clear, except for some density in the left lower lobe. The flaccid and reverse movement of the left diaphragm is indicative of paralysis of the left phrenic nerve.

On swallowing barium in the anteroposterior position, the esophagus is displaced to the right, as if by some extrinsic pressure. In the lateral position, the esophagus is displaced backward. The sacculation pulsates synchronously with the left ventricle and with the radial pulse.

Radiostereoscopic examination of the chest shows the bony thorax normal. The heart is small, but apparently otherwise normal. The aorta is markedly widened and presents a definite sacculation, which appears to involve the descending aorta just below the arch. The trachea is displaced to the right of the midline. The right diaphragm is low. The left is high and fixed. There is considerable increase in the hilus markings and in the lower lobes, particularly the left, where there is a definite localized area that is probably partly atelectatic and partly bronchiectatic. The vertebral branches are within normal limits for an individual of this age. The lung markings throughout the parenchyma of both lungs are within normal limits with the exceptions previously noted.



Aneurysm of the aorta.

Conclusion: Saccular aneurysm of the aorta; paralysis of the left phrenic nerve, probably due to pressure from the aorta; bronchiectasis and atelectasis, probably the result of pressure on a bronchus from the aneurysmal sac; probable paralysis of recurrent laryngeal nerve due to pressure of aneurysmal sac. Suggest Wassermann of the blood.

Wassermann ++++ blood.

Patient died suddenly. Probably from ruptured aneurysm. Autopsy was not obtained.

1800 *Eye Street, Northwest.*

What?—62nd Annual Meeting of Medical Society of Virginia.
Where?—Roanoke, Virginia.
When?—October 6, 7 and 8, 1931.
Why?—Come and See!

VITAMIN B: A REVIEW*

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Foreword

As the subject of this paper. namely, vitamin B, was the first of all the vitamins to be discovered, it is easily understood what a tremendous volume of literature has accumulated since its discovery. The writer has made an attempt to review all the literature obtainable and herewith submits that which he thinks of scientific interest in general and medical interest in particular. He has, of course, tried to omit reports of experiments which have been replaced or disproven by more advanced ideas by more recent experimental evidences. This article, the data and facts, are in their entirety those which the writer has found in the standard literature.

Vitamin B

F. Gowland Hopkins many years ago recognized the impossibility of animals to live on pure diets consisting of protein, carbohydrates, and fats, even if minerals salts were present in the requisite amounts. At this time he called attention to the fact that some other substance or substances, indefinable as yet, were necessary for normal growth and normal health, the total lack of which preeminently caused death. Following this, Funk, realizing the validity of Hopkins' theoretical statement and believing that these totally unknown substances were possibly related to the chemical amino groups, placed in the scientific nomenclature the word "vitamin" as a more precise term for these vital amines. Immediately following this it was perceived and advanced from various sources that a number of diseases already well known might possibly be related to a disturbed balance of these new substances. Since this time great advances have been made in the comprehension of these substances, but their mode of action, their chemical nature, and their physical properties are still almost entirely obscure.

Contingent with the discovery of these new vital substances and Eykmann's elucidation in 1897 on a far-Eastern disease called beriberi which he found was prevalent among those who partook of rice in great quantities, in fact, who lived on practically a single diet of rice prepared in a certain way, namely, that process called polishing, vitamin B was brought forth as the first of the group of vitamins. It is interesting to note that this pathological condition of beriberi is of great antiquity in China, the greatest rice consuming nation in the world. It is possibly mentioned in the oldest medical treatise, it having attracted much attention among the Anglo-Indian surgeons in the early 19th century. We may date the modern study of the disease from Malcolmson's Monograph, published in Madras in 1835. The opening of China and Japan in later years gave an opportunity for European physicians to investigate the condition. Eykmann did vasts amounts of experimentation in this field and described the pathological findings and symptoms of the disease. Severe outbreaks of beriberi have occurred even in the United States.

These so-called vitamins are now considered to be accessory food substances, the exact nature of which have not been established. They are necessary, as stated above, to the life of the individual, and each of the six varieties known at present play a definite role in our nutrition. Definite diseases are now known to be caused by insufficient quantities of these vitamins in the diet as was perceived with the first introduction of the theory of their existence. Generally speaking, we may term the pathological condition caused by the deficiency of any or all of the vitamins, avitaminosis. Vitamin B is a water soluble substance and plays an essential part in the growth of animals. It is also called the antineuritic vitamin because polyneuritis, such as is seen in beriberi, follows the lack of vitamin B in the diet.

Vitamins are directly or indirectly of plant origin. Animal tissues containing vitamins are due to the diets of the animal in question. Of all the vitamins, vitamin B is the most widely distributed. occurring in practically all natural foodstuffs. (See Chart I). Yeast is the leading source, and of man's ordinary foods the following have been found to have the highest concentrations of vitamin B: asparagus, beans, lettuce, prunes, spinach, egg yolk, tomato, cabbage, turnips, milk, potato, etc. Great quantities are contained in cereals and it is found that great portions are contained in the embryo of some of the grains, whereas, in others the outer layers contain the greatest quantities. In some it is equally distributed throughout the entire grain. This was first demonstrated by Mendell and Osborne

*Submitted by Dr. Wm. B. Porter, Professor of Medicine, Medical College of Virginia, for the author.

and contrasts the first idea that only the outer layers were rich in the substance.

Many substances have been investigated and found to exert antineuritic influences in pigeons, the laboratory animals used in the experiments. Fresh ox-bile and 10 per cent infusion of roasted walnuts, hazel nuts and others have displayed this property. Of all the substances investigated the greatest antineuritic properties have been found in the urine of rabbits. This urine seems to have the greatest, the most complete, and the most permanent antineuritic effects. To ascertain the actions of the various chemicals known to occur in urine and blood plasma and to explain their mode of exerting antineuritic influences when administered to pigeons in conjunction with polished rice, will require further necessary investigation. It seems warranted by the facts known at present to make a statement to the effect that a single antineuritic principle is not justifiable.

With regard to the distribution to vitamin content of our ordinary diets and foods, exact quantitative estimates cannot be given, but the relative amounts present can be determined by feeding experiments, or in some cases by color reactions.

The exact chemical nature of this vitamin is not known. It has long been considered to be an organic base and Williams considers it to be a cyclic N compound with a substitution of 0 in the ring, and capable of existence in a betaine configuration. Many and various attempts have been made to isolate and to determine the exact chemical structure of vitamin B but to the present time this has been quite unsuccessful. Seidell, Levene, and van der Hoeven have been foremost in this undertaking. Seidell reports in one of his many articles, the isolation from brewer's yeast of a substance which possesses antineuritic properties, which he claims to have a formula of $C_8H_{17}O_3N_3$ and a molecular weight of 201.

Vitamin B is a relatively stable substance, even more stable than either vitamin A or vitamin C. It is practically insoluble in all solvents other than water, alcohol, and glacial acetic acid. At high temperatures it is more stable in acid than in alkaline solutions. As it will resist a temperature to 120° Fahrenheit, it is naturally unaffected by ordinary cooking temperatures so far as decomposition is concerned. It has also been found that it is stable with regard to age as foods containing it have been kept for as long as thirty-five years and the vitamin still was found to be potent.

The only way known at present to standardize this substance is through the use of biological assay methods, using albino rats in the determination of the growth-promoting power and pigeons in estimating the antineuritic power.

We know little of the functions of this substance in the body. In the literature there are found many contradictory reports of experimental works and from this it must be assumed that after all there is much to be learned before we can come to a satisfactory understanding of the physiological reactions that take place upon its administration and also upon its withdrawal from the diet. Wright claims that vitamin B acts by facilitating the carrying out of the functions of the gastro-intestinal tract. Lack of this vitamin, he points out, causes diminished food consumption, loss of weight, and ultimate death due to intestinal stasis and absorption of toxic bodies resulting therefrom. Tsukiye and Okada isolated a substance from rice polishings which seemed to be related to histamin or to pyrimidin and which exerted a strong curative action on beriberi and which they thought to be identical with vitamin B. They found that with this almost pure extract pancreatic amylase secretion was stimulated but no effect was noted on either lipase or trypsin, as had previously been reported by other experimenters. This erroneous report they considered to be due to impurities in the substances used. They also found by pancreatic fistula experiments that not only the amount of secretion was increased but also the enzyme content was increased likewise and they, therefore, concluded that it was through this means that vitamin B plays such an important role in digestion and increased body weight.

Damianovich reports that vitamin B deficiency leads to a reduction in the amount of catalase in the liver. Catalase is an enzyme found in the body tissues, especially the liver, and under certain conditions acts in the formation of hydrogen peroxide which is used by the body in processes of oxidation. Thus, if his report is true, we can readily see what a tremendous effect this decreased important function of oxidation would have, especially in such an important organ as the liver.

Vitamin B causes an increase in the weight of the liver, kidney, and heart, but the greatest increase is shown in the testes and ovaries. Deficiency of this substance causes the testes to

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atrophy with definite signs of degeneration in the seminal epithelium.

The conception that vitamin B plays a part in both digestive and tissue enzyme is strengthened by the fact that in the diet deficient in vitamin B the respiratory quotient is low, whereas the normal consumption of the necessary amount increases the respiratory quotient. Basal metabolism seems to be closely related to vitamin B, a fact that will be more fully explained in the following pages.

Cowgill, along with some of his associates, in 1926, have shown (1) that gastric atony is a part of the syndrome of an advanced stage of vitamin B deficiency; (2) that successful vitamin therapy applied to such a case is associated with a rapid improvement in the tone of the stomach musculature; (3) that the continued feeding of liberal amounts of vitamin B—enough to satisfy completely the body's requirement—to an organism subsisting on a diet adequate in other respects, aids in the maintenance of a satisfactory gastric tonicity. Nelson and his associates have shown an interesting relationship that exists between muscular fatigue and vitamin B by the following statement: "Fatigue curves produced by animals on diets lacking in vitamin B show progressive diminution in amplitude and endurance as the length of time on the diet increases. These curves also show progressive loss of tonicity and an irregularity of contracture that seems very characteristic."

In summarizing the action of vitamin B in the body, we can say that it definitely stimulates the appetite. The ingestion of a diet deficient in vitamin B over a period of time causes a loss of appetite, lower food intake with natural loss of weight, and definite polyneuritic symptoms, general cachexia, similar to severe inanition, and disturbances of the glands of internal secretion, the whole picture, as it seems, originating in the involvement of the central nervous system. All of these are quickly allayed by the administration and addition of vitamin B to the diet. The suprarenals enlarge along with decreased adrenalin output. This is increased with the carbohydrate consumption and decreased, on the other hand, with protein consumption. In spite of the fact that the ingestion of vitamin B in sufficient amounts seems to stimulate the appetite and lead to increased physical efficiency, there is no experimental evidence showing how yeast and other foods, high in vitamin B concentration and potency, bring about these alterations in a biological response.

Vitamin B is thought to be stored when taken into the body in excessive amounts and the body can then utilize it as the need becomes necessary.

In general the pathology noticed in vitamin B deficiency is for the most part confined to the central nervous system. There are changes in the peripheral nerves, and degenerative inflammation involving the axis cylinder and medullary sheaths. In severe cases the phrenic and vagus nerves are affected with the natural results involving the respiratory and circulatory systems following. Likewise, there is noted degenerative processes of the voluntary muscles including the myocardium.

Data obtained from experimentation on widely different species of animals tend to show that vitamin B is closely related to metabolism.

It has been found that certain meat extracts which contain no vitamin B, nevertheless stimulate the flow of gastric juice in dogs on diets deficient in vitamin B, but, on the other hand, have no effect so far as the stimulation of the dogs appetite is concerned. It is, therefore, concluded that this vitamin *must* have some quantitative relationship with appetite. Data seems to show that the vitamin B requirement in adult animals is very closely related to the product of: (1) the two-thirds power of the weight which may indicate surface or "active protoplasmic mass" or whatever the metabolism depends on (2) the quantity of energy handled as indicated by the total calories utilized from the food, and (3) the body weight. The following formula has been constructed embracing these factors. By it a number provisionally called the "vitamin B constant" may be calculated:

$$\text{(a)}\quad \frac{\text{vitamin B per day}}{\text{2/3 weight}} = \kappa\text{vitamin} \times \text{calories per day} \times \text{weight}$$

whence

$$\text{(b)}\quad \kappa\text{vitamin} = \frac{\text{vitamins per day}}{\text{calories per day} \times \text{2/3 weight} \times \text{weight}}$$

$$\text{(c)}\quad \kappa\text{vitamin} = \frac{\text{vitamin}}{\text{calories} \times \text{5/3 weight}}$$

This formula gives good agreement with experimental data for adult rats, dogs, and mice. It appears, however, that during growth some other factor, as yet undetermined, affects the vitamin requirement, K vitamin during this period having a higher value.

It has been also shown that relatively speaking the male requires more vitamin B than does the female. The significance of this very interesting finding is of great biological importance and involves much data of experimental basis which the writer considers of little importance in this particular paper and, therefore, not justified of consideration. The reader is referred to G. A. Hartwell's article in the *British Journal of Experimental Biology*, Volume 2, pages 323-330, 1925, for such data.

As early as 1920, Emmitt and Luros, after a series of experiments called attention to the fact that the antineuritic and growth-promoting factors of vitamin B were at least tentatively not the same. Later on in this same year those two men, in trying to prove their first statement, found that the antineuritic factor was destroyed by subjecting it to a certain temperature, whereas the growth-promoting factor remained potent at the same temperature. In this remarkably successful experiment, vitamin B containing foods were exposed for one hour to a temperature of 120° Fahrenheit and fifteen pounds of pressure, which resulted in the evidences mentioned above and which were sufficiently conclusive to prove the distinctiveness of the two factors mentioned. Thus, it is now known that the water-soluble vitamin B is in reality composed of two separate and distinct entities, one possessing the power to prevent and cure polyneuritis, the other exhibiting a growth-promoting potency.

Goldberger, of the United States Public Health Service, along with some of his associates, published in February, of 1926, a series of reports calling attention to a factor which he termed "P-P" or "pellagra-preventive." "The P-P factor," he stated, "is distinct from the antineuritic factor of vitamin B but may be identical with the growth-promoting factor or possibly Wildier's 'Bios.' It may be inactive unless accompanied by the antineuritic factor." The disease of pellagra is a very prevalent one, occurring mostly in the southern part of the United States. In 1917-1918 there were 200,000 cases recorded in the United States. It is an old disease, dating back, according to medical history, to 1735 when it appeared in endemic form in Spain, and was first described by Cazal in 1762, who named it "mal de la rosa." Frapolli gave it the name of pellagra in 1771, a name denoting "rough skin." a characteristic dermatitis being one of the features of the disease. As far as its true etiology is concerned, there is still much controversy and investigation going on, and finality has not been reached. Whether or not Goldberger was correct in his surmise, and it is fairly generally accepted that he was not, remains to be determined by further investigation. It is merely mentioned here, this "P-P" factor, because the possibility that it *may* be associated with another distinct facor or perhaps one of the known factors of vitamin B has not been entirely discarded.

Mention is also made here to a "special nutritive principle," elaborated by Wildier in 1901 in his paper appearing in *La Cellulé*. He called attention to the fact that this substance was necessary to the growth and proliferation of yeast, and, as the substances which contained vitamin B in the greatest concentration were also potent in yeast growth stimulation, he considered the two identical. This has been disproven in recent years by Williams, who has proved conclusively that "bios" is a separate and distinct entity and has no relation to vitamin B whatsoever.

In children the usual polyneuritis and even death may be the end-results from a deficiency of this water-soluble vitamin B. In a less radical deficiency, malnutrition, with disturbances of digestion and assimilation, results. Impaired growth, health and vigor result with increased susceptibility to infection. Internal glands are also deranged—the thymus, testes, spleen, ovaries, pancreas, and thyroid. Drummond has pointed out that sterility in males quickly follows when deprived of this vitamin. McCarrison believes that the lack of this vitamin "may afford some explanation of the genesis of that great mass of ill-defined gastro-intestinal disorders and vague ill-health which forms so large a portion of human ailments at the present day." Matheu has called attention to the fact that the addition of vitamin B to the diets of infants suffering from metabolic disturbances apparently causes an increase in the "index of tolerance" and results

in rapid increases in appetite, weight, and in the number of red blood corpuscles.

Yeast has been suggested by many to replace wheat embryo extract in infant feeding. Evidence points to the inadvisability of such a course as it generally results in diarrhea, although a slight stimulation in growth is noted in some, whereas in others none at all.

It has long been known that the transitory influence of insulin used in diabetic therapy was prolonged and favored by a balanced diet. The addition to such a diet of vitamin B or levulose or a mixture of these two substances allows a greater interval of time between the injection of insulin, and increases the efficiency of the single dose. These conclusions are based on a twenty-four hour output of ketonic substances and of B-hydroxybutyric acid. We are indebted to Desgrez for this interesting and highly important factor in insulin therapy.

From a bacteriological standpoint it has been found that certain members of the acid-fast group of organisms contain in their bodies a substance capable of stimulating growth in animals on a diet deficient in vitamin B. Decreased resistance to bacterial invasion has been called attention to in deficiency diets and that there is no relationship existing between anthrax immunity from vitamin B ingestion, as had previously been reported.

Various diets excellent for the growing individual may be totally unsuitable for the lactating individual. The lactating animal requires more vitamin B to rear her young to normal animals than at any other time of her life. Polyneuritis from vitamin B deficiency has been observed in the second generation when the mother's breast milk was deficient even though she herself was entirely devoid of symptoms. Therefore, it is necessary to increase the vitamin content of the expectant mother's diet if the young are expected to be of the normal variety.

In conclusion, we would like to call attention to a more intimate consideration of the condition known as beriberi, which is, as is well known, a pathological condition brought about by a deficiency of vitamin B in the diet. Peripheral neuritis with spastic symptoms and paralysis, atrophy of many of the secreting glands, lymphopenia, and general decrease in the processes of oxidation, have been described in this affection. Hyperglycemia occurs in birds fed without this vitamin, but, if the carbohydrates are withheld, the birds seem to withstand the vitamin deficiency longer. Vitamin B extracts administered will prevent and cure all of this.

The idea of an infectious etiology for beriberi has been held by many. Noel Bernard, of the Pasteur Institute in Saigon, has produced all the phenomena of beriberi in pigs by a combination of avitaminosis with inoculation with a bacterium which he has isolated.

In beriberi there are acute and chronic forms, with or without edema. There are usually evidences of great wasting and also cardiovascular disturbances in addition to the paralysis. The hypertrophy of the right side of the heart is especially constant and striking and yet does not occur in the experimental rice disease. Nagayo, one of the most experienced men in this field, has contrasted true beriberi and the experimental rice disease as follows:

"There is anemia and lymphopenia in the rice disease, with emaciation and hyperglycemia, but these do not occur in beriberi. The peripheral neuritis is the same in both, with paresis, lactation, and, finally, coma, but in beriberi there are cardiac symptoms, with chronic passive congestion and cardiac hypertrophy, which do not occur in the rice disease. The rice disease, in association with the lymphopenia, has an atrophy of the lymph nodes, while in beriberi they are swollen as in status lymphaticus. With regard to the adrenals, the medullary hypertrophy in beriberi contrasts with the condition in rice disease in which there may be hypertrophy of the cortex. Finally," he states, "the rice disease is a recognized affection of human beings known in Europe as 'mehlnahrschaden'."

It is evident that there is more to be learned about beriberi before we positively identify it completely with the lack of vitamin B.

December 22, 1930.

Note: Since this article was completed there has appeared in the literature a most interesting article entitled "Vitamin B 'complex' in a concentrated aqueous liver extract." It is written by Alfred Chanutin, Ph.D., an instructor at the University of Virginia. It will be found in the VIRGINIA MEDICAL MONTHLY for January, 1931, page 637. This article is recommended to the reader and especially to those interested in the modern liver extract therapy.

January 15, 1931.

DISTRIBUTION OF THE SIX VITAMINS[1]

Source of the Vitamin	Vitamin A	Vitamin B	Vitamin C	Vitamin D	Vitamin E	P-P factor
	Anti-ophthalmic and growth promoting	Anti-neuritic and growth promoting	Anti-scorbutic	Anti-rachitic	Anti-sterility	Pellagra preventive factor
Alfalfa	+++	++	*		+	
Apples	+	++	++	*	*	
Artichoke	+	+				
Asparagus	*	+++	*	*	*	
Bananas	+?	+	++	*	*	
Barley (whole)	+	++	—	*	+ 2	
Beans (kidney)	+	+++	*	*	+ 3	
Beans (string)	++	++	++	*	*	
Beets	*	+	+	*	*	
Bread (wh.te)	?	+	—	—	+	+ 12
Bread (wheat)	+	++	?	?	?	
Butter	+ to +++ 6	—	—	+	+ to —	
Buttermilk	+	++	+ V	?	*	
Cabbage (raw)	++	++	+++	—	?	
Cabbage (cooked)	+	++	+ V	—	*	
Cabbage (canned)	+	++	?	—	*	
Carrots (raw)	++	+	++	?	*	
Carrots (cooked)	++	+	+ V	?	*	
Cauliflower	—	++	*	*	*	
Celery	+ to —	++	++	—	*	
Cheese	++	++	—	*	*	
Cocoanut oil	—	—	—		+	
Cod liver oil	+++ 5	—	—	+++ 5	?	?
Corn	+	++	—	?	+	
Cream	+++ V	+	+ V	*	+ to — 6	
Eggs	+++	+	—	+	+	+
Egg white	—	*	—			
Egg yolk	+++	++	—	+		
Fish (fat)	+	+	*	—		
Fish (lean)	V	+	*	—		
Flour (white)	—	+	—	—		
Flour (wheat)	+	++	—	?	+	
Glucose	—	—	—	—	—	
Grape fruit	*	++	++	—		
Hemp seed	+	*	*	*	++	
Honey	+ to —	+ to —	—			
Ice cream	++ V	++	+ ?			
Lard	+ to —	—	—	+ to —		
Lemon juice	+ to —	++	+++	*		+
Lettuce	++	++	+++	+	+	++ 10
Meats	+ to —	+	++ V	++	+ or —	+ or —
Milk (fresh)	+++	++	++ V	+ V	+ or —	
Milk (condensed)	+++	++	+ V	+ V	+ or —	
Milk (dried)	+++	++	+ V	+ V	+ or —	
Milk (evaporated)	+++	++	+ V	+ V	+ or —	
Milk (skimmed)	+	+ V				
Oats	+	++	?	?	+	
Olive oil	— ?	—	—	—	+	
Onions	+ to —	++	++			
Orange juice	+	++	+++ 5		—	
Parsnips	+	++	*			
Peaches	++	— ?	++			
Peanuts	+	++	*			
Peanut oil	+ to —			+ to —	+ to —	
Peas	++	++	+++	+	+ (leaves)	
Pineapple	++	++	+++			
Potato (sweet)	++	++	++	—		
Potato (white)	+	++	++			
Prunes	+ V	++	—			
Pumpkin	+					
Radish	—	+	*			
Rice (polished)	—	—	—	—	—	
Rice (whole)	—	++	—			
Raspberries	*	*	+++			

DISTRIBUTION OF THE SIX VITAMINS[1]

Source of the Vitamin	Vitamin A Anti-ophthalmic and growth promoting	Vitamin B Anti-neuritic and growth promoting	Vitamin C Anti-scorbutic	Vitamin D Anti-rachitic	Vitamin E Anti-sterility	P-P factor Pellagra preventive factor
Rye	+	+	?			
Spinach (raw)	+++	+++	+++	?		+
Spinach (canned)	+++	+	+ V	?		
Starch	—	—	—	—	—	
Strawberry juice			++			
Sugar			—	—	—	
Tomato (raw)	++	+++	+++ 5	—		
Tomato (canned)	++	+++	+++ 5	—		
Tomato (cooked)	++	+++	+++ 5	—		
Turnip	+ to —	++	+++			
Walnut	*	++	*			
Wheat (whole)	+	++	—	*	+	
Wheat (flour)	—	+	—	—		
Wheat (grain)	++	+++	— ?	?	++	
Wheat (oil of germ)					+++ 5	
Wheat (bran)	+	++	?			
Yeast	—	+++ 5	—	—	—	+++ 11

1 The vitamin is present in minimal amount.
\+ The vitamin is present in fair amount.
++ indicates a good source of the vitamin.
+++ Indicates an excellent source of the amount.
— No appreciable amount of the vitamin present.
? Indicates doubt as to the presence or relative amount of the vitamin.
* Evidence of lacking or insufficient.
V Variable.
2 Present in sprouted barley.
3 Present in sprouted beans.
4 Butter is not standardized and vitamin content variable within wide limits.
5 The outstanding source of this vitamin.
6 The higher vitamin in milk of cows on green pasturage.
7 May be made to assume antirachitic properties by irradiation.
8 Similar to butter.
9 Crisco

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On to Roanoke!

Cordially,
MARY GRAY HODGES,
President.

President's Report for 1930 of the Woman's Auxiliary to the Medical Society of Virginia to the Woman's Auxiliary to the American Medical Association.

The annual meeting of the Woman's Auxiliary of the Medical Society of Virginia was held in Norfolk October 21-23, 1930, at which time, Mrs. J. Allison Hodges succeeded Mrs. F. W. Upshur as President, and the other officers were elected at this meeting. Mrs. Hunsberger was the guest of honor and made a short address, filled with information and inspiration concerning the accomplishments of the Auxiliary of the American Medical Association. We were glad Mrs. Hunsberger was present to hear the reports of our State Auxiliaries, especially that of Norfolk County, which is our Banner Auxiliary, and has many good deeds to its credit.

It was February before the Chairmen of all the Departments could be secured. We have endeavored to have our Standing Committees correspond to those of the National Auxiliary, in so far as they are necessary for the State work.

Health Education.—Mrs. Southgate Leigh, Chairman, prepared an excellent "study outline," which was sent with the "Blue Primer" to the Auxiliaries; also they were advised to use the study envelopes sent out by the American Medical Association Auxiliary.

Legislation.—Mrs. F. W. Upshur, Chairman. The Virginia Legislature has not been in session this Winter and no active work could be done, but the members were urged to inform themselves about the bills which will be presented at the next Legislature, such as the bill which will compel the father to give the illegitimate child a name, and support it until of age; also the bill concerning the sterilization of defectives, birth control, etc., so that they can vote intelligently upon these measures when presented in 1932.

Public Relations.—Mrs. W. F. Drewry, Chairman, has cooperated with the Y. W. C. A., Woman's Clubs, Parent Teachers, and Educational Associations in putting on health lectures and is also studying the subject of Federal and State Medicine, which is said to be rapidly encroaching upon private practice in our State.

Organization.—Mrs. M. N. King, the Chairman, has been very active in trying to form new Auxiliaries, especially in the mountain districts where the need of Health Education is greatest. We realize that, to accomplish results, the whole State must be organized, and are working to that end.

Hygeia.—I regret that our Chairman, Mrs. Phillips had to move from Virginia this Spring, so we are temporaily without a State Chairman. Norfolk sent in 134 and Richmond 146 subscriptions the past year. *Hygeia* was placed in a number of schools and libraries.

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We have an Advisory Committee of three doctors from the Medical Society of Virginia and no work is undertaken by the Auxiliary without their approval.

Auxiliaries.—We have four County and three City Auxiliaries, and a number of members at large. The Norfolk Auxiliary collected over 1,200 books and 2,000 magazines and is establishing permanent libraries in hospitals and welfare organizations. Its outstanding achievement was a card party from which more than sixteen hundred dollars was realized. This money is to be used to endow a "Bed Unit" in the Tidewater Victory Memorial Hospital.

The Richmond Auxiliary contributed to the Fund to supply milk and lunches to the first grade of kindergarteners, as the children were not properly nourished. They have paid special attention to the patients at the colored hospitals, St. Philip's and Dooley's, supplying them with clothes, medicine, etc., and are making layettes. Last Summer in a civic parade in which there were more than 100 floats, their float won the first prize—a silver cup. It depicted Walter Reed experimenting with the mosquito in his search for a cure for malaria. Interest was added to the float by Dr. Masters and the nurse who were with Dr. Reed when he was making his experiments, taking part in the tableau.

State Auxiliaries.—These Auxiliaries have taken part in securing County nurses, have worked for the hospitals, especially the crippled children, provided lunches for the school children, lectures for various organizations, have cooperated in all health movements, and are filling a vital need in their own communities.

The mid-Winter meeting of the Executive Committee was held at the home of the President in February. After the routine business was finished, Mrs. Hodges suggested two opportunities for service: *first*, the education of prospective mothers. The State Society through its Department of Clinical Education is seeking to educate women in maternal welfare by holding prenatal and postnatal clinics throughout the State. It was urged that assistance in this work be made the special duty of each Auxiliary. The appalling mortality record in maternity cases in the United States, which is said to be the highest in the civilized world, makes it our imperative duty to do our part in this humanitarian and necessary work; *second*, Public Health Education in general, by assisting schools and other organizations to put on Health Programs. To further this work, Mrs. Hodges sent out, in cooperation with the State Health Department, more than 200 letters with a "Pre-School Program" enclosed to the members of the Auxiliary and other women's associations, asking them to see that every child before entering school goes to his family physician for a thorough examination. In helping to put on this program, the Auxiliary will not only render the State a great service, but it will be of real educational value to the adult in emphasizing the importance of an annual physical examination. The responses to this letter have been most gratifying. The President has written many letters, several articles for the State Journal and attended numerous meetings.

The official publication, the VIRGINIA MEDICAL MONTHLY, has generously given us several columns in each issue, which we gladly fill and find it a great help in informing the public, as well as the members, of the work of the Auxiliary.

We cannot expect to have a very large State organization, as our Auxiliary differs from all other women's associations which are composed of women of varied interests and whose husbands represent all professions and occupations. Our husbands represent but one profession, that of scientifically ministering to human ills. This fact should bind us in closer fellowship and make us more earnest in our individual efforts to promote the work of both the State and American Medical Association Auxiliaries.

Respectfully submitted,

MARY GRAY HODGES,
(MRS. J. ALLISON HODGES),
President, Woman's Auxiliary to Medical Society of Virginia.

June 9, 1931.

The Truth About Medicine

In addition to the articles enumerated in our letter of July 25th, the following have been accepted:

Sandoz Chemical Works, Inc.
Gynergen Solution 0.1 per cent.
E. R. Squibb & Sons
Squibb Chocolate Vitavose.
Winthrop Chemical Co., Inc.
Skiodan.

New and Non-official Remedies

The following products have been accepted by the

Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Non official Remedies:

Elixir No. 229 Ephedrine Sulphate 2 grains.—It contains ephedrine sulphate—Lilly (New and Non-official Remedies, 1931, p. 177), 0.44 Gm. in 100 c.c. (2 grains per fluid ounce), in a menstruum composed of alcohol, glycerin, sucrose and water, with flavoring agents. Eli Lilly & Co., Indianapolis.

Ventriculin, 100 Gm.—Each bottle contains 100 Gm. of ventriculin (New and Non-official Remedies, 1931, p. 238). Parke, Davis & Co., Detroit. (Jour. A. M. A., August 8, 1931, p. 391).

Accepted Devices for Physical Therapy

The following have been accepted by the Council on Physical Therapy of the American Medical Association for inclusion in its list of Accepted Devices for Physical Therapy:

Eveready Professional Model Carbon Arc Lamp.—It is designed for general radiation therapy in physicians' offices or clinics. The lamp is mounted on a large rugged stand, equipped with rubber wheeled, ball bearing casters which permit the lamp to be moved easily over the floor. The Professional Model is designed to operate on 115 volt, 60 cycle, alternating current circuit through a standard outlet (base plug or wall plug). The lamp is claimed to offer three distinct types of therapeutic radiation, namely, infra-red, visible, and ultraviolet. National Carbon Company, Inc., Cleveland, Ohio. (Jour. A. M. A., August 15, 1931, p. 462).

Eveready Solarium Type Carbon Arc Lamp.—It is designed to administer therapeutic light treatment simultaneously to groups of patients. The lamp is designed to be attached to the ceiling. The length of the unit is approximately three feet and the width and depth depend on the number of units included in each lamp. It is claimed that the lamp provides a source of therapeutic artificial sunlight for group irradiation, the ultraviolet content being much richer than that of natural sunlight. National Carbon Company, Inc., Cleveland, Ohio. (Jour. A. M. A., August 22, 1931, p. 541).

Propaganda for Reform

Use of Cinchophen and Neocinchophen.—In consideration of reports of untoward effects, it would be well to discontinue the use of cinchophen and to substitute neocinchophen for it. Even though neocinchophen owes its activity to cinchophen, it is so slightly soluble as to be almost tasteless, devoid of irritant action on the stomach, and of remarkably low toxicity. If cinchophen is prescribed it should be under its pharmacopeial name and not as "Atophan," which is more expensive and is marketed with unwarranted claims. If Neocinchophen is wanted it should be prescribed under this name and not under the uninforming designation "Tolysin." In view of the serious though rare poisoning from ordinary doses of cinchophen, the use of this drug should be restricted as much as possible to cases in which other non-narcotic analgetics, such as salicylates, acetysalicylic acid or amido-pyrine, have been tried and failed to give adequate relief, and in which the suffering is sufficiently great to justify the risk. (Jour. A. M. A., August 8, 1931, p. 409).

Cultivation of "Common Cold" Virus.—The growing conviction that "common colds" are not due to any micro-organism thus far included in commercial vaccines, but to an unknown filtrable virus or group of viruses, is strengthened by the currently reported successful cultivation of bacteria-free pathogenic nasal filtrates. The work indicates conclusively that the filtrable agent associated with "common colds" multiplies or is multiplied in the embryonic tissue medium. (Jour. A. M. A., August 15, 1931, p. 466).

Arsphenamine and Neoarsphenamine.—Comparisons of the therapeutic value of arsphenamine and neoarsphenamine must take into account the difference of arsenical content, which is one-third higher in the case of arsphenamine than in the case of neoarsphenamine. Even allowing for this difference, it is quite generally conceded that arsphenamine as such is therapeutically the more effective than neoarsphenamine. The evidence for the efficiency of neoarsphenamine is conspicuously small. The most carefully investigated and reported clinical material has been treated with arsphenamine rather than with neoarsphenamine. One of the characteristics of neoarsphenamine, which will affect any attempt to estimate its gross clinical value, is the marked variability between different lots of the preparation even from the same manufacturer. (Jour. A. M. A., August 15, 1931, p. 480).

Disinfectants.—In combating contagion, modern sanitary practices have eliminated disinfectants for spraying walls, ceiling and floors of school rooms. The source of infection is the individual; so long as the infected individual is present in the room, any disinfectant that might be used on the walls or the floor would be of little if any value in preventing infection. Removal of the infected individual usually suffices to end the danger of spreading the infection. Soap and water is the best agent for cleaning floors, together with plenty of fresh air and sunshine Terminal disinfection, such as fumigation with formaldehyde, has been generally discarded as valueless In the case of lavatories, urinals and toilet bowls, so-called germicides in reality accomplish nothing except covering up the primary odor by the stronger odor of the chemical used. "Disinfection of hands" may be obtained by a thorough scrubbing with soap and water. In laboratories in which pathologic material is being handled, a solution of mercuric chloride or a solution containing "compound solution of cresol" may be employed. (Jour. A. M. A., March 28, 1931, p. 1098).

Norman Baker's Radio Station KTNT—Norman Baker, of Muscatine, Iowa, is known to the medical profession chiefly because he blackguards the profession and because he exploits alleged cancer cures as part of his many commercial activities. He is suing the American Medical Association for half a million dollars for alleged libel. Not long ago, Norman Baker applied for a renewal of his broadcasting license for his station, KTNT. The Chief Examiner for the Federal Radio Commission, recently filed with the Commission his report recommending that the license be not renewed. It is reported that the Commission extended the license until April 30, 1931, pending final decision. (Jour. A. M. A., April 4, 1931, p. 1167).

Medical Economics and Medical Business.—For some time physicians have been receiving regularly and complimentary a publication known as "Medical Economics: the Business Magazine of the Medical Profession." The contents of this periodical are devoted largely to the problem of making money out of medical practice. It is apparently little if at all concerned with medical ethics or medical ideals. The vast majority of its space is devoted to the advertisements of products of many manufacturers whose preparations could not possibly be passed by the Council on Pharmacy and Chemistry. Even those manufacturers who cooperate largely with the Council, find in this alleged medical publication an outlet for the announcements of their products that the

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Council will not accept. (Jour. A. M. A., April 25, 1931, p. 1404).

Refined Antipneumococcus Serum.—Since the discovery of the etiologic relationship of the pneumococcus to pneumonia, the search for an effective antipneumococcus serum has continued unabated. Little progress was made in this direction until 1913, when the biologic classification of pneumococci, by Dochez and Gillespie, provided a rational basis for modern serum therapy in this disease. Reports on the use of refined and concentrated serum preparations bring evidence showing that a considerable reduction in the mortality rate of type I pneumonia is secured by the use of these preparations. Experiments with the type II pneumonia and particularly types III and IV, were not favorable to the use of preparations representing these types. In conformity with the evidence, the Council on Pharmacy and Chemistry accepts antipneumococcus serum representing type I, but does not accept serums representing other types or mixtures of all types, holding that type I serum alone is worthy of clinical trial. (Jour. A. M. A., May 2, 1931, p. 1505).

Old Tuberculin in the Treatment of Tuberculosis.—Koch reported tuberculin to the profession, in 1890, and it was hailed as a specific remedy; unfortunately, it was administered in a somewhat reckless way by inexperienced clinicians, and the disadvantages soon resulted in widespread condemnation. Tuberculin is not a selective curative remedy in the treatment of tuberculosis. It is not a specific. It should not be used by general practitioners in routine office practice, but by specialists in the sanatorium or home where there is careful clinical supervision of the patients. (Jour. A. M. A., May 16, 1931, p. 1720).

Limitation of the Manufacture of Narcotic Drugs.—In accordance with the provisions of the Hague convention of 1912, Congress made laws for controlling and regulating the production of and the traffic in the drugs mentioned by the convention. Now domestic production and traffic in these dangerous drugs is limited by Federal law. The importation of opium and coca leaves into the United States is restricted. The enforcement of the laws have, however, not prevented the importation of drugs for illicit uses. Introduction of narcotic drugs by smugglers cannot be prevented until other countries control the manufacture and export of narcotic drugs adequately. To this end our government initiated the movement which resulted in the calling of the International Opium Commission, at Shanghai, in 1909, and since then has continued in its efforts along these lines. The manufacture of narcotic drugs must be limited to approximately medicinal and scientific needs. Physicians must aid in the determination of such needs by limiting their own prescribing to indispensable uses. The pitiful character of the drug addict and the association of drug addiction with crime and other menaces to the public welfare demand all the help that physicians can give in solving this problem. (Jour. A. M. A., May 9, 1931, p. 1623).

The Censorship of Medical and Dental Advertising.—One of the primary reasons for the establishment of the Council on Pharmacy and Chemistry of the American Medical Association in 1905 was the desire of the editor of The Journal of the American Medical Association for scientific advice concerning claims made by advertisers for proprietary remedies. The Board of Trustees of the American Medical Association give the fullest support to the Council by refusing space in the advertising pages of publications of the American Medical Association to advertisers of proprietary remedies who failed to meet the Council's requirements. With that support the Council has made its work and its name respected. The advertising pages of the publications of the American Medical Association and of the state medical journals that cooperate afford a striking contrast to the pages of the *British Medical Journal* and of the *Lancet* (London), which exercise a so-called censorship without, however, having behind the censorship the type of scientific study and control represented by the Council on Pharmacy and Chemistry. The Council on Dental Therapeutics of the American Dental Association began its work with high ideals and with enthusiasm. In 1930, the trustees of the American Dental Association adopted a resolution to place the association squarely behind the Dental Council in its efforts. Then, at the midwinter session of this association, held in February, 1931, the board of trustees practically reversed its previous action, placing the business manager of the periodical in a position of judgment over the council and making him arbiter as to whether or not the criticisms of the council shall be referred to the manufacturer. Without the power of the trustees of the American Dental Association and the periodical of the association whole-heartedly behind its work, the Council on Dental Therapeutics will be ineffective. (Jour. A. M. A., May 16, 1931, p. 1697).

Ephedrine In Narcolepsy.—The use of ephedrine sometimes results in sleeplessness. Whereas, this effect might contraindicate the use of ephedrine in some circumstances, it has seemed to indicate its utilization in others. For instance, ephedrine has been found effective in counteracting the results produced by some of the barbiturates and of morphine. Ephedrine has also been used in the treatment of narcolepsy and its related phenomenon, cataplexy. (Jour. A. M. A., May 9, 1931, p. 1626).

Book Announcements

Simple Lessons in Human Anatomy. By B. C. H. HARVEY, M. D., Professor of Anatomy, University of Chicago. Chicago, American Medical Association. 1931. Octavo of 434 pages. Illustrated. Cloth.

Dr. Morris Fishbein states that this is perhaps the first popular treatise on anatomy made generally available, fully illustrated, and at the same time authoritative.

Planning Lunches for School Children. Of special value for parents, teachers and nutritionists. Both are published by the Evaporated Milk Association, 203 North Wabash Avenue, Chicago.

The Adventures of Eva, Pora and Ted—a comic strip collection, copies of which may be had upon request to the publishers.

Tables of Food Values. By ALICE V. BRADLEY, B. S., Supervisor and Instructor of Nutrition and Health Education. State Teachers College. Santa Barbara, California. The Manual Arts Press. Peoria, Illinois. 1931. Octavo of 128 pages. Cloth. Price, $2.00.

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Editorial

Failures of School Children.

No editorial comment could bring to the practitioners of the Medical Society of Virginia more forcefully the need for cooperation with the State Board of Health, in the matter of the health of the school child, than the subjoined testimony of the various speakers at the recent meeting of the Virginia Public Health Association, held May 14, 1931.

Let the doctors of Virginia note what these speakers brought out and think on these things!

DR. S. B. HALL, State Superintendent of Public Instruction, listed the main causes of failures in school as (1) Teacher does not know the child's mental, moral or character age. (2) Physical handicaps.

"Failures are too expensive to be allowed to continue. Last year 28,482 Virginia pupils failed to pass their grades, and will have to repeat them. It costs $35 a year for each pupil in the elementary grades; $65 for each High School student—an average of $50 per pupil—making a total of over a million dollars Virginia is spending each year that can be saved with proper management."

MISS LESLIE FOX, Rural Supervisor, Warren County, Virginia, stressed the teacher's part in preventing failures, outside of the faults that might be in the teaching process. The annual physical inspection by the teacher shows the main defects that need correction. The teacher can by various devices arouse a pupil's desire to be physically fit to do his best class work, and by showing a real interest, often persuade his parents to have their family physician look him over and give or advise any treatment found needed.

MRS. W. A. ROSE, King George County, a rural mother of school children, emphasized the parents' need of closer contact with the Child Health Program in order that they may sooner be educated to the point of realizing how many failures would be prevented by the elimination of defects at the beginning of their children's school life.

This closer contact can be brought about through better cooperation between family physician, parent and teacher.

Parents should have an intimate part in school clinics, examination by the family physician, etc. It is noticeable that the average parent becomes more intelligently interested in such activities with each experience.

On these occasions the family physician is helping to give the parents that education in their children's needs which the teacher has inspired them to ask, and which will encourage them to further efforts along these lines. At the same time the physician is gaining, through such interested parents, a vision of the importance of this work.

DR. W. F. DREWRY, Director Bureau Mental Hygiene, Richmond, spoke on The Emotional

Disturbances of the Failing School Child. "Whether the emotional disturbance (not mental deficiency, as that is a subject requiring separate consideration) is the chief causative factor in the child's failure to make his grade, or whether the failure to make his grade caused the child's emotional upset, are matters of sufficient importance to receive the attention of both the physician and the teacher, as well as the parent.

"Emotional disorders in the school child may come as a sequelae of a brain injury, encephalitis, or some infectious disease, or to endocrine disorder, changes incident to puberty, etc.; or the emotional disturbance may be the effect of excessive efforts incident to school work, insufficient nutrition, sleep, play, and the like.

"Hygiene of the child's mind, and special attention to his emotional state, are as important as the condition of his body. Both constitute joint studies for doctors interested in child health and welfare, for the classroom teacher, the visiting teacher, the school nurse, the social worker, the psychologist and the neuropsychiatrist."

Dr. W. B. Hill, a rural physician, Rectory, Stafford County, Virginia, said: "What part will the doctor play in readjusting the maladjusted school child? The ultimate aim is to create a new family doctor. The old doctor had everything we want in the new doctor except a modern view and the use of prophylaxis rather than waiting to cure. He will have to be educated. The persons to educate the doctor are the families that he treats. The doctors will be educated when the intelligentsia realize that prevention is more valuable in dollars and cents than medicines or prescriptions.

"Would it not be well to have a questionnaire to be filled out jointly by the mother and the teacher, and then taken to the family physician? Thus all three might know the child's health habits and the history of any abnormal symptoms, either physical or emotional. The physician should then examine the child from tip to toe. He will thus often find little things that may easily cause nervous and other disturbances."

Dr. W. B. McIlwaine, Petersburg, Virginia, President Pediatric Society, had for his subject *Health Habits of the Failing School Child*, and said in part: "Heredity, environment, poor physical condition, poor mental calibre, poor health habits, and public school failures are usually a part of the same picture—one of ignorance and poverty. From such conditions comes a poorly kept, under-nourished, overstimulated, fatigued child, with definite physical imperfections.

"The above applies to a large majority of the failing children in our schools; but what of the children here and there who have apparently a parentage and environment conducive to at least passing the work of our public school system? In these children bad health habits are certainly a predominating factor in their failure; but after all, if we analyze the reason for their bad habits what do we find? Is it the child's fault if he is allowed to stay up till eleven and twelve o'clock and is tired out the next day? Is it the child's fault that he is not taken to the dentist, or does not eat the proper diet? Is it the child's fault that he fails to study? No, we must place the blame where it belongs, on the parents and the environment those parents make for their child. We physicians are entirely too mealy-mouthed towards most parents—that's where our work must concentrate. Educate the parents to the value of proper environment and health habits to the school work of a child, and we shall have fewer failures by far."

Dr. A. T. Finch, Chase City, Virginia, representing the Medical Society of Virginia, named three causes of failure of the school child—mass illiteracy, lack of county informative effort, and lack of evaluation and cooperation by physicians. "The lack of evaluation and cooperation by the family physician is one of the main obstacles to prevention of failures due chiefly to physical handicaps. Sometimes it is difficult for physicians to see the real value of carefully examining well children. Where such examinations have been made, statistics show that many defects have been found, and when these defects have been corrected, the children have developed into good students. Hence we realize that every child between the ages of six months and six years should be examined semi-annually by his family physician and family dentist to find and correct the beginnings of any defects, and thereby prevent much sickness and retardation at school. We further realize that no child should be obliged or allowed to enter school suffering from any removable handicap. To carry out this work, we family doctors must

catch a real vision of the value of child welfare work. We must render enthusiastic aid to the organized agencies. We must help with all our might in reaching and extending a helping hand to mothers and children to assist them into the light of health education. The 90,000 children annually entering school need our help to profit by their advantages. If we doctors will learn to give our best efforts to the fifteen point standard Pre-School Child Examination the results will be so outstanding that parents will recognize its full worth and these little patients will be brought to our offices at least once a year for the early recognition of things which later may produce sickness and much loss of time at school."

In order to really put this work over, in the most helpful manner, we need Organized County Effort, best emphasized in the Welfare or County Health Unit. This unit will be able to contact the mothers and children in the remote places, and by their sympathy and interest will be able to teach and demonstrate to the mothers, the real need and the real benefit to be derived by having the well school child examined and when defects are found to persuade them to have these defects remedied. This Unit in conjunction with the teachers, can do so much to help these unfortunate children to become some of the brightest and best pupils in the schools, as well as real assets to their homes and communities.

Dr. B. B. Bagby, President of the Association, in summing up the discussion said: "You have heard the failing child ably discussed by representatives of professions most interested in children. We all agree that it is the duty of the health workers and the teachers to convince the parents that at least an annual examination of each child and correction of defects perhaps just starting, will save trouble, money, and go far towards preventing failures in school; that it is the duty of the physician to carefully examine each child and supervise his development, and that the results will be in direct proportion to the part that each plays in this program.

"The enormous waste of the State's money in caring for repeaters in the schools must be stopped in some way; the best way is through the full cooperation of the Department of Education, the Department of Health, and the family physicians.

Considering Complications of the Diabetic Patient.

Pathology may be in the making in the diabetic after a few years. Few there are, after the fourth or fifth decade, that do not show a wide range of pathologic change. The symptoms of the malady affect varied parts of the body and they are but tokens often of complicating pathology. The trail of morbid growth may be followed as one attends through months and years a given diabetic case, or the varied assortment of symptoms, arising in various systems of the body, in the diabetic patients, as they come to hand, combined to indicate the widespread complications to be found in this disease. Murphy and Maxon* note the complications in a study of some 827 cases. They found that of the 827 cases of diabetes studied, 146 exhibited no complications but that in the remaining 681 cases there were one or more associated diseases. In this group of 681 with complications, 428 died. They found or assorted seventy-five complicating diseases which they tabulated in a group of fifty-two specifications. They grouped these complications under the following heads: (1) Diabetic Coma; (2) Cardiorenal Vascular disease; (3) Infections; (4) Tuberculosis; (5) Carcinoma; (6) Syphilis; and (7) Miscellaneous.

Diabetic coma as a complication is an imminently grave one. Practitioners formerly were forced to fear this complication as the most formidable one, but now through modern treatment, as secured in hospitalization, weighed and balanced diets and insulin administration, diabetic coma is more or less successfully prevented or relieved. Nevertheless, conditions prevail in practice that will continue to cause this complication to arise. Deaths even will occur from diabetic coma in practice, but fewer and fewer such deaths should occur as practitioners are able to avail themselves of the treatment offered by modern medicine. Here, as elsewhere, the success of the treatment will depend upon factors surrounding the illness of the patient. Juvenile patients demand especial care; also cases with infection, nephritis, syphilis, and other complications demand especial knowledge and hospitalization in order to ward off diabetic coma.

Cardiorenal vascular disease is the more or less constant running mate of chronic diabetes. Practitioners may feel sure of the presence, in

*Am. Jour. Med. Sc., September, 1931, page 301.

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more or less advanced form, of pathologic change affecting the heart, blood vessels and the kidneys of the diabetic over fifty years who has had the malady with any marked degree of severity for a few years. In this group, cardiorenal vascular complications constituted the most common type met with. There were found 273 cases with this complication.

Gangrene, the most striking and imperative of vascular complications, was found in seventy-two patients and of this number thirty-five died. A complication of this severe nature, advancing in patients with this malady, if detected early, should and will occur more rarely as conditions of practice improve and as patients are instructed in these grave possibilities of neglect of diabetes mellitus.

Arteriosclerosis in association with diabetes works destructive changes in the heart and kidneys. In this group of diabetic patients, forty showed heart disease. It is not apparent whether these cases of heart disease were primarily superinduced by diabetes, but it may be assumed, whether or not diabetes aggravated previous pathology, it did not originally set it up. Heart failure with death occurred in twenty-two of these cases of heart complications. The group of patients with diabetes and cardiac disease show a higher mortality rate than do cardiopaths without diabetes. The same observations may be made in the realm of nephritis and vascular disease.

Infections are serious complications in the diabetic. In this group there were eighty-six cases of infection. While any infection is borne poorly by the diabetic, pneumonia may be most dreaded or feared. The hospital figures of these authors showed a mortality of pneumonia of the non-diabetic type of 54.5 per cent, but of the diabetic a pneumonia mortality rate of 87.5 per cent was experienced.

All operations in which there is the factor of recovery of wound and the possibility of operation in infected areas must be considered most serious because of the grave danger of infection. The skin of the diabetic is never free from the possibilities of infection; accidental bruises and cuts of the skin, abrasions, particularly about the extremities are the occasion often of complications.

Tuberculosis showed as a complication in forty of these cases and sixteen died. Judging at the time of diagnosis of diabetes it was estimated that fourteen of these cases were non-tubercular but later developed the disease, while twenty-six were known to have both diabetes and tuberculosis. It appears to be true here as in other infections that the mortality is increased in the diabetic as compared to the non-diabetic. It may be stated in another way by saying that the arrest or retarding of tuberculosis in a diabetic is influenced greatly by the therapeutic management of the fundamental disease of metabolism—diabetes.

Syphilis in this large group of diabetics was found to be present in thirty-one cases and eight of them died giving a mortality rate of 29 per cent. The usual mortality rate of the hospital where these observations were made for non-diabetic syphilitics was 18.1 per cent. The same conclusion seems apparent here in this infection as in others—that the diabetic-syphilitic has a higher mortality rate than the non-diabetic-syphilitic. In the face of two maladies like diabetes and syphilis, the therapeutic problem is one of difficulty but it would seem that the diet-insulin-management of diabetes would but render more effective specific action of modern anti-syphilitic treatment.

From this consideration of 827 diabetics treated at the Milwaukee County Hospital, from January, 1922, to January, 1930, one may form a general judgment of the problems involved in diabetes and its complicating symptoms and pathology. It may be a matter for congratulation that in these figures, taken from an experience of the past eight years, it is shown that the complications of diabetes may be assuaged, if not relieved, by the use of modern treatment of diabetes with diet, insulin and fluid. It may be further thought that the modern treatment of diabetics by hospitalization and insulin treatment will do much to lessen the incidence of the complications of diabetes. More general adoption of the treatment by practitioners, earlier discovery of the disease, hospitalization of the diabetics for accurate study of individual needs in weighed and balance diets and measured insulin administration, will all tend to give a larger control over the disease itself and its complications.

Primary Carcinoma of the Duodenum.

Two recent papers direct attention to this subject. For years it has been more or less a question whether or not primary carcinoma occurs in the duodenum. The occurrence of carcinoma in the wall of the stomach is rel-

atively quite common, but primary carcinoma of the duodenum, quite often the site of ulcer, is rare. However, as pointed out by Meyer and Rosenberg,[1] the first report of a case of primary carcinoma of the duodenum was made as early as 1746. In 1761 Morgagni reported the second case, but for a hundred years following, no known reference in the publications was made to primary carcinoma of the duodenum. In the paper referred to a report of four cases is made and discussion is given of the clinical and diagnostic points incident to the subject.

Besides, one may peruse the paper of Hinton[2] who makes the inquiry, does carcinoma of the duodenum ever arise from duodenal ulcers? It is known that the site of ulcer of the duodenum is usually the supra-ampulla, while in a study by Deaver and Ravdin it was stated that the second portion of the duodenum was a more favored site for carcinoma. It is admitted that primary carcinoma occurs and this author indicates its rarity by noting that in 151,201 autopsies, collected from publications of nine workers, only fifty duodenal carcinomas were found, and autopsies embracing 25,787 bodies at the University of Pennsylvania showed only seven instances of primary carcinoma of the duodenum.

In the light of these figures and of clinical experience as recorded in medical publications, one may judge that primary carcinoma of the duodenum is a lesion of extreme rarity in practice, but that it does occasionally occur. We may, therefore, form the general opinion in contemplating the possibilities of carcinoma occurring in the matter of duodenal ulcer that it is extremely remote but does take place.

1. Meyer and Rosenberg. **Arch. Int. Med.**, Vol. 47, No. 6, page 917.
2. **Amer. Jour. Med. Sc.**, Vol. clxxxii, No. 6, page 843.

President's Message

Our Society: Something of its Past Work and Future Hopes.

The Sixty-Second Annual Session of the Medical Society of Virginia at Roanoke, October 6th-8th, will mark an important era in the history of organized medicine in Virginia. Originally functioning but once a year, the Society now carries on its scientific and educational work by means of twenty Standing and Special Committees, with a total membership of more than one hundred physicians, representing all sections of the State. As a result, this work is continuous and the influence of the Society is greater and more truly representative than ever before. It is now not only scientificaly self-instructive, but through its educational agencies is affecting the health and welfare of all of the people, and becoming a real factor in helping to solve many of the welfare and sociological problems of the day.

The Society at last realizes its full responsibility and seeks, in return for its appreciation by the public, to give of its special and skilled knowledge for the advancement of the profession and the people, utilizing every available means to this end, except the methods and machinations of politics. It studies the changing trends of the times and seeks, in cooperation with other like organizations, to weld and widen the opportunities for better scientific and more humanizing service. Just as there is a growing health consciousness on the part of the public, there has been an increasing civic consciousness in medicine. In other words, in order to fulfill its true destiny, medicine is no longer essentially individualistic, but is fast coming to have a public character.

In this new trend of thought and action, medicine should develop a public health service through cooperation and should assume leadership in all such relationships; for if organized medicine does not meet these demands of the times, other agencies of un-organized medicine will, and gradually, respect and appreciation of our work will materially decrease. The profession has always done individual preventive work, as well as curative medicine, for the one is as scientific as the other. Consequently, the work of the Society during recent years has been notably developed in its scope and methods of education not only of the members, but of the public.

Some of the Work Accomplished

Among the major activities and advances are the following:

1. An increased interest in continued medi-

cal study by the physicians, themselves, through the organization of the Department of Clinical Education which, by means of clinical lectures and practical courses of instruction, has brought the advances of medical science to practitioners without their having to leave their fields of work;

2. The appointment of a Joint Committee on Prenatal and Postnatal instruction, with representatives from the State Society and both Medical Colleges, which will provide a Clinician and Nurses, who will visit every section of the State and, with the cooperation of the local physicians, hold clinics showing the availability of modern medical service and care;

3. The appointment of a Committee on Child Welfare, which is doing special work in arranging for the examination, etc., of children of the pre-school age;

4. The appointment of a joint Committee on Public Education, which is designed to educate correctly the people on all medical matters; and

5. The appointment of a Public Relations Committee, County and State, which is actively seeking to correlate the work of the Society with all civic organizations doing similar work and, when necessary, giving proper information, and taking the leadership.

As a result of these diversified efforts, the scientific and educational work of the Society is being constantly enlarged and over-lapping agencies are being more centralized and directed to greater efficiency. Likewise, many diseases formerly calling for highly specialized medical service are now being steadily brought within the scope of the practice of the average general practitioner. As a further evidence of the value of the continuation method of graduate education, it has been noted that earlier diagnoses of disease have been made and special modern forms of treatment have been adopted.

Some of our Hopes

1. That the renewed spirit of scientific service and medical self-instruction shall continue to develop;

2. That our Medical Colleges, because of this new spirit, may soon be enabled to have a cooperation of effort from the profession that will enable them to enlarge their Post-graduate Courses, so as to give fuller practical educational courses to those practitioners desiring them; and

3. That our members may increasingly avail themselves of the scientific and educational benefits offered by the Society and ultimately become a profession, not only thoroughly and practically educated in modern scientific methods, but one that, through the years, will continue to be "up-to-date" and fully competent and which, because of scientific training and special skill, will always be ready to serve, not only its own individual clientele, but to render a larger service to the growing demands of a changing civilization.

J. Allison Hodges, M. D.,
President, Medical Society of Virginia.

Department of Clinical Education
OF THE MEDICAL SOCIETY OF VIRGINIA

Post-graduate Education.

Next month will mark the second anniversary of the attempt, on the part of the Medical Society of Virginia, to institute a regular campaign of Post-graduate Education for practitioners throughout the State. At the meeting of the House of Delegates in Norfolk, last November, a resolution was adopted, by which the President-Elect was made chairman of this Department. It is with mixed feelings of relief and regret that I approach the end of the year, hoping that the work may go on growing and improving under the leadership of my successor, for whom I bespeak your hearty cooperation and assistance.

We have had something to say on this page, in each issue of the Monthly since last November. To those, who were kind enough to write for this page, in the cause of Post-graduate Education, I am sincerely grateful and am sure their contributions have added much to the interest and value of what has been said. The other members of the Department of Clinical Education and the Advisory Board have been helpful and sympathetic. The councilors have shown great interest in working up clini-

cal meetings in their District and, with the assistance of Mr. G. W. Eutsler, our executive secretary, have really been the leaders in this work.

The members of the faculties of our two State medical schools have cooperated with us at all times, giving us valuable advice and providing clinicians and lecturers for the meetings at various points throughout the State.

The officers of local societies and their members have encouraged us by arranging meetings and programs in various communities, and the attendance at all of the clinical gatherings has been good.

Dr. J. Allison Hodges, our President, has been untiring in his efforts to help and encourage us and has assisted in every possible manner.

Mr. Eutsler, our executive secretary, has contributed greatly to the success of the work by his thorough and efficient methods of advertising the meetings, by means of cards and notices.

Our aim and purpose has been to teach medicine of today to the general practitioners by practical methods and clinics, held in various towns and villages throughout the State. At a number of these meetings we have been fortunate in securing speakers of national reputation. We have endeavored to emphasize the importance of continued education for all physicians and we feel that considerable progress has been made.

There is good reason to hope, after these first two years' experience, for still more progress and greater interest during the coming year.

We have much to learn and our methods will doubtless be improved as new hands take hold and new leaders show the way.

I. C. Harrison, M. D.,
President-Elect and Chairman, Department of Clinical Education.

Information

All members of the Medical Society of Virginia are requested to write for any information desired on any subject relative to these Extension Courses in Graduate Medical Education either to the Executive Secretary, Mr. George W. Eutsler, P. O. Box, 707, University, Va., or to the Chairman of the Department.

Roanoke Clinics, October 6th

The Clinics, sponsored by the Roanoke Academy of Medicine, and to be held on the afternoon of the opening day of our State Society meeting, promise to be perhaps the most interesting ever held in this State, in that we will have three men of national reputation—Dr. P. Brooke Bland, professor of obstetrics at Jefferson Medical College, Philadelphia; Dr. Charles Gilmore Kerley, professor of children's diseases at the Polyclinic Hospital, New York City; and Dr. Russell L. Cecil, professor of medicine at Cornell University, New York City.

This will be a wonderful opportunity which none of our members can afford to miss.

REMEMBER—

Clinics—Obstetric, Pediatric and Medical.
Place—Ball Room, Patrick Henry Hotel.
Time—Tuesday, October 6th, from 2:00 to 5:00 P. M.

University Clinic

The program of the eighth Post-Graduate Clinic at the University of Virginia Hospital will be marked by two changes made in the interest of more attractive and more practical meetings. On both afternoons visiting physicians will be conducted on Ward Rounds by heads of the various departments. On the morning of the second day a Symposium on the Liver will be held, in which several members of the Medical Faculty will take part.

On Thursday evening there will be the usual Open Discussion when questions may be submitted by the visiting physicians.

All members of the medical profession are cordially invited to attend and are especially urged to remain during both days of the clinic. A detailed program will be mailed later.

Scheduled Meetings

The following are programs of Norfolk County Medical Society for October, 1931:

12th October—Section on Surgery—Subjects to be announced later.

19th October—Section on Medicine—On the Use of Instruments of Precision in the Diagnosis of Heart Disease—Dr. Jas. W. Hunter.

Myocardosis—Dr. Walter P. Adams.

22nd October—Section on Eye, Ear Nose and Throat—Allergic Rhinitis—Dr. Jos S. Hume.

Ulcerative Keratitis, Bilateral with Prolapse—Dr. S. B. Moore.

The Significance of Pain in Acute Ear Cases, With report of two cases—Dr. Wilson E. Driver.

26th October—Section on Pediatrics—Poliomyelitis, With Special Reference to Serum Treatment—Dr. Claiborne Willcox.

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Proceedings of Societies

The Mecklenburg County Medical Society

Held its last meeting on September 15th. This was most interesting, there being a number of visiting physicians besides the regular members present. The following papers were read: Tetanus by Dr. I. C. Harrison, Danville; Clinical Aspects of Coronary Thrombosis by Dr. J. M. Hutcheson, Richmond; Treatment of Nervous Patients by Dr. D. P. Scott, Lynchburg; Infantile Paralysis—Early Symptoms by Dr. W. B. McIlwaine, Petersburg; and Case Reports by Dr. W. M. Winn, Clarksville, and Dr. G. Norfleet Carter, Boydton.

Officers elected for 1932 are: president, Dr. G. H. Carter, Boydton; vice-president, Dr. B. S. Yancey, Chase City; and secretary and treasurer, Dr. A. T. Finch, Chase City (re-elected). Delegate and alternate for the 1932 meeting of the Medical Society of Virginia were also elected at this time.

The Rockingham County Medical Society,

At its annual meeting, held recently, re-elected Dr. N. M. Canter president and Dr. J. C. Harshbarger secretary. Both officers are of Harrisonburg. Delegate and alternate to the Roanoke meeting of the State Society were elected at this meeting.

Fairfax County Medical Society.

At the August meeting of this society, the following officers were elected: president, Dr. C. A. Ransom, Falls Church; vice-presidents, Dr. Lyle Mason, Washington, D. C., and Dr. R. L. Wilkins, Alexandria; treasurer, Dr. F. M. Brooks, Fairfax Station; and secretary, Dr. Wm. P. Caton, Accotink (re-elected). Delegate and alternate to the Roanoke meeting of the Medical Society of Virginia were also elected at this time.

The Southampton County Medical Society,

At its meeting on September 10th, re-elected Dr. J. N. Applewhite, Capron, president, and Dr. W. T. McLemore, Courtland, secretary. Drs. Macauley Babb, Ivor, and R. L. Raiford, Franklin, were elected delegate and alternate, respectively, to the Roanoke meeting of the State Society.

The Prince Edward County Medical Society,

At its annual meeting on September 21st, elected the following officers: President, Dr. Thos. G. Hardy; vice-president, Dr. J. Weldon Smith; secretary-treasurer, Dr. Susan W. Field, all of Farmville. Delegate and alternate to the Roanoke meeting of the State Society were also elected at this meeting.

The following new members have been taken into the Society during the past year: Drs. Jos. H. Smith, Thos. E. Knight, and Caleb S. Stone, Jr., all of Farmville.

News Notes

High Lights of our Roanoke Meeting.

THE ROANOKE CLINIC

On the afternoon of Tuesday, October 6th, the physicians of Roanoke, as a courtesy to the members, have arranged for a Clinic that will be most instructive, and has some rather unusual features:

First—It is to be held at one place, the Patrick Henry Hotel, the official headquarters of the Society at its Annual Meeting;

Second—It will illustrate many of the more common diseases in general practice in the branches of Internal Medicine, Obstetrics and Diseases of Children; and

Third—It will be demonstrated by three visiting Clinicians, Dr. Russell L. Cecil, of New York City; Dr. P. Brooke Bland, of Philadelphia; and Dr. Charles G. Kerley, of New York City, all of whom are eminent in their special fields of work. It is hoped that many members will be present at this most interesting Clinic, for it promises to be unusually instructive.

Mental Hygiene Symposium

The Special Topic for this year's discussion, Mental Hygiene, its scope and application to medicine, as well as its relations to the general public, will be the special order for the consideration of the members on Wednesday morning, and it is believed that it will prove to be a most timely and appreciative discussion.

The opening speaker will be Dr. Ralph P. Truitt, of Baltimore, Professor of Psychiatry in the University of Maryland (invited guest), and he will be followed by Dr. D. C. Wilson, Professor of Nervous Diseases at the University of Virginia; Dr. W. F. Drewry, Director of the Bureau of Mental Hygiene, of the Virginia Department of Public Welfare; Dr. B. R. Tucker, Professor of Neurology and Psychiatry, at the Medical College of Virginia, and three other members of the Society, who will briefly note its relations to the different specialties of medicine and surgery.

All members are urged to be present for an unusually interesting and comprehensive discussion which will be given by this carefully selected group of eminent and authoritative leaders.

Introduction of New State Health Commissioner

Another rather unusual feature of this year's meeting will be the formal introduction of Dr. W. F. Draper, successor of Dr. Ennion G. Williams, to the members and physicians of the State, at the Wednesday night meeting.

Dr. Draper will at that time make an address and outline his views on the "Interrelationships of Preventive and Curative Medicine."

All State Health Officers and County Health officials are cordially invited to attend this meeting.

That "Winding Road"

The Medical Faculty of Roanoke, in providing for the final afternoon Session at Catawba Sanatorium, are offering the members a most pleasant and diverting feature this year, but probably they were not aware that unwittingly they were giving, especially to the "Down-Easters," a pleasure in seeing beautiful scenery that is seldom equalled, except in a country "girt about by rugged mountains."

Delegates to Roanoke Meeting.

A number of component societies have not yet reported names of their delegates and alternates. These are urged to send names at once to the Executive Offices, 104½ W. Grace Street, Richmond. Those already listed are:

Delegate	Society	Alternate
	Accomac	
Dr. J. H. Ayres		Dr. W. M. Burwell
	Albemarle	
Dr. D. C. Smith		Dr. R. L. Page
Dr. A. D. Hart		Dr R. T. Ergenbright
	Alexandria	
Dr. Llewellyn Powell		Dr. W. E. Beattie
	Alleghany-Bath	
Dr. B. B. McCutchan		Dr. A. D. Tyree
Dr. G. A. Torrence		Dr. M. B. Jarman
	Amelia	
Dr. J. M. Habel		Dr. G. A. Arhart
	Augusta	
Dr. A. L. Tynes		Dr. R. S. Griffith
	Bedford	
Dr. W. O. McCabe		Dr. M. P. Rucker
	Charlotte	
Dr. C. M. Nicholson		Dr. C. W. Tucker
	Fairfax	
Dr. C. A. Ransom		Dr. William Meyer
	Fauquier	
Dr. W. C. Payne		Dr. Geo. H. Davis
	James City-New Kent	
Dr. J. R. Parker		Dr. J. R. Tucker
	Loudoun	
Dr. Geo. H. Musgrave		Dr. John A. Gibson
	Lynchburg and Campbell Co.	
Dr. George J. Tompkins		Dr. B. H. Kyle
Dr. H. B. Spencer		Dr. Ernest G. Scott
	Mecklenburg	
Dr. W. W. Wilkinson		Dr. B. S. Yancey
	Nelson	
Dr. F. M. Horsley		Dr. J. C. Everett
	Northern Virginia	
Dr. J. G. Brown		
	Mid-Tidewater	
Dr. E. C. Cobb		
Dr. Thos. B. Latane		Dr R. D. Bates
Dr. Wm. Gwathmey		
Dr. R. R. Hoskins		
Dr. E. L. W. Ferry		
Dr. M. H. Eames		
Dr. Harry Tabb		
Dr. L. O. Powell		
Dr. M. H. Harris		
	Nansemond	
Dr. C. J. Riddick		Dr. G. R. Joyner
	Norfolk	
Dr. Walter B. Martin		Dr. F. D. Wilson
Dr. N. G. Wilson		Dr. J. D. Collins
Dr. H. L. Myers		Dr. C. L. Harrell
Dr. Julian L. Rawls		Dr. W. P. McDowell
Dr. P. St. L. Moncure		Dr. C. J. Andrews

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Delegate	Society	Alternate
	PATRICK-HENRY	
Dr. W. C. Akers		Dr. W. N. Thompson
Dr. E. N. Shockley		Dr. D. L. Fleshman
	PITTSYLVANIA CO. AND DANVILLE	
Dr. P. W. Miles		Dr. W. W. Robertson
	POST-GRADUATE	
Dr. W. C. Harmon		Dr. F. N. Mallory
Dr. H. C. Jones		Dr. Meade Edmunds
Dr. B. J. Atkinson		Dr. G. M. Naff
Dr. W. W. Bennett		Dr. J. A. B. Lowry
Dr. D. L. Elder		Dr. J. M. Bailey
Dr. W. D. Kendig		Dr. H. E. Whaley
Dr. W. W. Seward		Dr. F. E. Steere
Dr. Joel Crawford		Dr. W. D. Prince
	POWHATAN	
Dr. R. D. Tucker		
	PRINCE EDWARD	
Dr. Ray A. Moore		Dr. Jos. H. Smith
	PRINCESS ANNE	
Dr. Cora Z. Corpening		Dr. H. F. Dormire
	RICHMOND ACADEMY	
Dr. St. J. Oppenhimer		Dr. W. K. Dix
Dr. Thos. W. Murrell		Dr. Thos. D. Jones
Dr. Warren T. Vaughan		Dr. J. B. Bullard
Dr. William A. Shepherd		Dr. E. H. Terrell
Dr. P. D. Lipscomb		Dr. [illegible] Graham
Dr. Wm. B. Porter		Dr. J. G. Lyerly
Dr. A. S. Brinkley		Dr. O. B. Darden
Dr. Dean B. Cole		Dr. J. Blair Fitts
Dr. J. M. Hutcheson		Dr. R. F. Gayle
	ROCKBRIDGE	
Dr. E. P. Tompkins		Dr. C. H. Davidson
	ROCKINGHAM	
Dr. H. Grant Preston		Dr. F. L. Byers
	SOUTHAMPTON	
Dr. McCauley Babb		Dr. R. L. Raiford
	SOUTHWESTERN	
Dr. L. F. Cosby		Dr. S. H. Yokeley
Dr. T. K. McKee		Dr. A. B. Graybeal
Dr. E. M. Chitwood		Dr. C. F. Graham
Dr. R. H. Harrington		Dr. B. F. Eckles
Dr. A. B. Woolwine		
Dr. R. H. Woolling		Dr. W. R. Cushing
Dr. J. L. Early		Dr. A. M. Showalter
Dr. B. F. Eckles		Dr. W. R. Gardner
Dr. W. C. Caudill		Dr. M. C. Newton
	WARWICK	
Dr. H. G. Longaker		Dr. J. Warren Sayre
	WISE	
Dr. W. R. Culbertson		Dr. J. B. Wolfe

Virginia Pediatric Society.

The annual luncheon meeting of this Society is to be held in Roanoke, on the second day of the annual meeting of the State Society—October 7th. This will be at 1:00 P. M. in the Red Room of the Patrick Henry Hotel, and the plates will be $1.50 each. All members of the State Society are invited. Reservations for the luncheon should be made through Dr. J. B. Stone, Secretary, 2042 Park Avenue, Richmond, or at time of registering in Roanoke. Dr. W. B. McIlwaine, Petersburg, is president this year.

The guest speaker at this luncheon meeting is to be Dr. Horton Casparis, professor of pediatrics at Vanderbilt University, Nashville, Tenn., which will talk on "Tuberculosis in Children: Prevention and Control."

The Virgina Roentgen Ray Club

Has planned to held its annual meeting at 6:30 P. M., Wednesday, October 7th, at the Patrick Henry Hotel, Roanoke. Dr. A. L. Gray, Richmond, is president, and Dr. Wright Clarkson, Petersburg, secretary.

Medical College of Virginia News.

The dormitory and educational unit of the St. Philip Hospital school of nursing was occupied by students on Monday, September 14th. This handsome building, the gift largely of several of the foundations, provides one full floor for library, laboratory, other teaching and recreational facilities. It will house 94 student nurses and staff members in single rooms with several exceptions. This new addition to the college plant fronts 110 feet on the north side of Marshall Street immediately north of the St. Philip Hospital. Formal opening of the building is scheduled for some time in October.

The total bequest of the late Martha Allen Wise toward the endowment of the St. Philip Hospital amounted to $144,114.66. The settlement of the estate was completed a few weeks ago.

Bids on the new college library, to be constructed adjoining the library and home of the Richmond Academy of Medicine on the northeast corner of Clay and Twelfth Streets in the college group, will be opened on September 24th. It is hoped that work on this long projected building will get under way early in October.

The Medical College of Virginia formally opened registration on Tuesday, September 15th. Approximately 750 students had completed registration by the time classes resumed at two o'clock on Wednesday, September 16th. It is expected that the usual matriculation of

about 800 will be reached by the time books are closed on September 22nd. The opening convocation was held on Wednesday, September 16th, with Dr. W. T. Sanger presiding. The deans, officials of the college, president of the student body, and Mr. Larrick, of the college Y. M. C. A., were introduced for brief remarks.

According to figures compiled in the office of Dr. W. T. Sanger, president of the College, 1,126 of the 2,500 physicians practicing their profession in this State are graduates of the Medical College of Virginia. Physicians practicing in Virginia counties total 1,121 and of this number 529 are graduates of this college and of 1,148 doctors in twenty Virginia cities 597, or 41 per cent, are alumni of the college.

News Notes From the Duke University School of Medicine and Duke Hospital.

On August 17th, Dr. J. D. Hart read a paper on Skin Transplantation at the meeting of the Buncombe County Medical Society, in Asheville, N. C.

On August 19th, Miss Bessie Baker, Dean of the School of Nursing, and Mrs. Nancy L. Lawlor, attended the meeting of the North Carolina State Nurses' Association, at Black Mountain, N. C., at which Mrs. Lawlor presented a paper on the Relationship Between the Hospital and Public Health.

On September 1st, the following new members of the staff were added: Dr. Angus M. McBryde, of the University of Pennsylvania, Instructor in Pediatrics; Dr. Walter B. Mayer, of the University of Pennsylvania, Assistant in Medicine, Dr. Harold Finkelstein, Assistant in Surgery, Dr. Anne Lawton, of Yale University, Assistant in Pediatrics, and Mr. Morton F. Mason, of Oregon State College, Assistant in Biochemistry.

On September 10th, Drs. Bayard Carter, J. D. Hart and Wilburt Davison spoke at the meeting of the local Medical Society at Danville, Va.

On September 15th, Dr. Davison spoke at the meeting of the Mecklenburg Medical Society, at Charlotte, N. C.

On September 11th, the Duke Hospital gave its annual barbecue followed by the meeting of the Durham-Orange County Medical Society.

On September 24th, at the meeting of the Seventh District Medical Society, at Sumter, S. C., Dr. Hart will present a paper on The Treatment of Chronic Empyema by Preliminary Tidal Irrigation by Thoracoplasty, and Dr. A. R. Shands, Jr., will give a paper on Insection In and About Hip Joint.

Married.

Dr. John Franklin Woodward, Jr., and Miss Isobel Robertson Carrington, both of New York City, September 26th. Dr. Woodward, formerly of Norfolk, Va., graduated from the University of Virginia in 1928. He is at present doing special work in ear, nose and throat at the Manhattan Eye, Ear and Throat Hospital, New York City.

Dr. John Winston Fowlkes and Miss Lucy Burwell Allen, of New York City, September 26th. Dr. Fowlkes is a member of the class of '15, University of Virginia, Department of Medicine.

Dr. William P. Richardson and Miss Treva Hedrick, both of Lenoir, N. C., recently. Dr. Richardson is an alumnus of the Medical College of Virginia in the class of '28.

American College of Surgeons.

Following closely our State Society meeting is the 1931 Clinical Congress and annual meeting of the American College of Surgeons. This will be held in New York City, October 12th-16th, with headquarters at the Waldorf Hotel. The name of this organization is sufficient guarantee of the splendid program which may be expected. Dr. C. Jeff Miller, New Orleans, is this year's president, and Dr. Franklin H. Martin, 40 East Erie Street, Chicago, is director general.

Dr. E. R. Ware,

Of the class of '28, Medical College of Virginia, after serving two years as intern in Baptist Hospital of Winston-Salem, N. C., and one year as resident physician of the City Memorial Hospital of that place, has located in Fredericksburg, Va., for the practice of his profession.

Dr. William C. Brice,

Who practiced several years ago at Stonega, Va., but now located at Silver City, N. Mex.,

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has been appointed health officer of Grant County, that State.

Dr. and Mrs. E. Pendleton Tompkins

And young son, of Lexington, Va., recently returned from a visit to Cape Cod, Mass. On their way home, they stopped in Philadelphia, to visit their elder son, Dr. Pendleton S. Tompkins, who is at present an intern in the University of Pennsylvania Hospital.

Post-Graduate Clinic at University Hospital.

A notice of the eighth Post-Graduate Clinic at the University of Virginia Hospital appears under SCHEDULED CLINICS in the Department of Clinical Education of this issue. Those interested in Clinics should read what it offers.

Dr. A. T. Finch,

Chase City, Va., was elected State Commander of the American Legion at its meeting in Clifton Forge, Va., the latter part of August.

Dr. and Mrs. Charles Lewis Baird

And Charles Lewis Baird, Jr., visited in Richmond, Va., for several weeks on their way to Fort Benning, Ga., at which post Dr. Baird will be connected with the hospital staff. Dr. Baird graduated from the Medical College of Virginia in 1929 and is a member of the Medical Corps of the U. S. Army.

Dr. John D. Ware,

Of the class of '29, University of Virginia, is now at 523 North Wolfe Street, Baltimore, Md. He is doing research work in otology under Dr. S. J. Crowe at Johns Hopkins Hospital.

Dr. Morgan, Dean at Georgetown University.

Dr. William Gerry Morgan, Washington, D. C., ex-president of the American Medical Association and an honorary member of the Medical Society of Virginia, was unanimously elected dean of the Georgetown University School of Medicine in that city, at a recent meeting. He is also a regent of the University.

The Southern Medical Meeting.

The Southern Medical Association holds its annual meeting, this year, in New Orleans, La.,—that lovely metropolis of the South, noted for its charm and as a medical center. The president is Dr. Felix J. Underwood, of Jackson, Miss.

The dates of this meeting are November 18th-20th, following which there will be a post-convention cruise to Panama, the Canal Zone, etc. There will be clinics, and plenty of scientific papers and exhibits. Other information may be obtained from Mr. C. P. Loranz, secretary-manager, Empire Building, Birmingham, Ala.

Dr. B. F. Randolph,

Arrington, Va., attended the Southern Pediatric Seminar at Saluda, N. C., from July 20th to August 1st.

Examination for Entrance into the Regular Corps of U. S. Public Health Service.

Examination of candidates for commission as Assistant Surgeon in the Regular Corps of the U. S. Public Health Service will be held at the following-named places on November 2, 1931:

Washington, D. C.,
Chicago, Ill.,
New Orleans, La.
San Francisco, Calif.

Request for information or permission to take this examination should be addressed to the Surgeon General, U. S. Public Health Service, Washington, D. C.

Goiter Classification and Nomenclature.

The American Association for the Study of Goiter, through its Corresponding Secretary, Dr. J. R. Yung, of Terre Haute, Ind., asks that we give publicity to its approval of the following classification and nomenclature:

CLINICAL CLASSIFICATION:

Type 1—Non-toxic Diffuse Goiter.
Type 2—Toxic Diffuse Goiter.
Type 3—Non-toxic Nodular Goiter.
Type 4—Toxic Nodular Goiter.

NOMENCLATURE:

The association advocates a policy of using the simplest and yet the most descriptive terminology possible.

The use of proper names, while it is impossible to dispense with many well established ones in goiter literature, be discouraged; as should coined words invented to popularize a fad or fancy.

Emphasis should be made upon the importance of not confounding varieties and sequelae with types. The use of such terms as exophthalmic, hemorrhagic, cystic, adolescent, col-

loid, intra-thoracic, substernal and congenital are perfectly proper when used to describe varieties, but only constant characteristics should be used to designate types.

Dr. L. Philip Cox

Has located in Fredericksburg, Va., where he will specialize in diseases of the eye, ear, nose and throat. Dr. Cox is a native of Mobile, Ala. Upon completion of his academic education at Davidson College, North Carolina, he studied medicine at the University of Pennsylvania, from which he graduated in 1929. Since then, he has spent some time in post-graduate study in his specialty.

The Interstate Post-Graduate Medical Association of North America

Has arranged an excellent program by speakers of national prominence for its meeting in Milwaukee, Wis., October 19th to 23rd, inclusive, under the presidence of Dr. Henry A. Christian, of Boston. Dr. Edwin Henes, Jr., Milwaukee, is secretary; Dr. George W. Crile, Cleveland, chairman of Program Committee; and Dr. Wm. B. Peck, Freeport, Ill., managing director.

Conference on Childhood and Youth.

Governor Pollard has called a State-wide Conference on Childhood and Youth to meet in connection with the regular annual meeting of the Cooperative Education Association, in Richmond, November 23rd and 24th. This will be a follow-up in Virginia of the White House Conference on Child Health and Protection. Dr. J. L. Jarman is chairman and Mr. J. H. Montgomery secretary of this conference and also members of the Planning Committee which is further composed of Dr. Sidney B. Hall, chairman of the Education Committee; Dr. Warren F. Draper, chairman of the Committee on Health; Mr. Frank Bane, chairman of the Committee on Welfare; and Dr. W. T. Sanger, chairman of Committee on Character and Civic Education.

This Conference will be opened by the Governor on the night of November 23rd. The following day there will be a number of committee meetings and that evening there will be a report on the findings of the committees and an inspirational address. All of these meetings are open to the public and a large attendance is expected.

Dr. John E. Gardner

Has returned to his practice in Roanoke, Va., after six weeks spent in special electrocardiographic work in the cardiology department of the Johns Hopkins Hospital, Baltimore, Md.

Doctors as Officers of Country Club.

Dr. R. H. Woolling was recently elected president of the Pulaski, Va., Country Club and Dr. R. F. Thornhill was elected a member of the board of directors.

International Association of Industrial Accident Boards and Commissions.

The annual meeting of this organization will be held in Richmond, Va., October 5th-9th, under the presidency of Parke P. Deans of the Industrial Commission of Virginia. Wednesday, the 7th, will be given over to a medical program and will be participated in by doctors interested in this work. The program of this section appeared in the September issue of the MONTHLY. Dr. G. H. Gehrmann, Wilmington, Del., and Dr. H. U. Stephenson, Richmond, vice-presidents of the general organization, will preside over the morning and afternoon sessions, respectively.

Dr. Edward N. Pleasants,

Who was graduated from Medical College of Virginia in 1927 and practiced until recently in Richmond, Va., has moved to Alloy, W. Va., where he is associated with Dr. Walter Simmons as one of the physicians with the Union Carbide Company.

Dr. Bertrand G. Lawrence

Has opened offices in the Medical Arts Building, Roanoke, Va., for the practice of Neuro-Psychiatry. Following his graduation from the Johns Hopkins University Medical School, Dr. Lawrence served one year as intern at the State of Wisconsin General Hospital, Madison, Wis. He then spent a year as Resident Neuro-Psychiatrist in the same Hospital and for the past year has been a member of the faculty of the Neuro-Psychiatric Department of the University of Wisconsin.

Dr. L. C. Haynes

Returned to his home at Mt. Jackson, Va., the latter part of September, after a stay of three months in Seattle, Wash., where he did post-graduate study at the various hospitals.

XUM

Dr. Beverley R. Tucker,

Richmond, Va., has just returned from a trip abroad. He went over to attend the International Congress on Nervous Diseases in Berne, Switzerland. There were 831 neurologists in attendance upon this meeting. These with members of their families acompanying them made a gathering of about 1,500.

Dr. and Mrs. R. H. Rowe

And children have returned to their home in Exeter, Va., after a visit to several places in North Carolina, including Hickory and Carolina Beach. Dr. Rowe was formerly located at Hickory but is now physician for the Stonega Coke and Coal Company at Exeter.

Dr. Van M. Ellis,

Of the class of '30, Medical College of Virginia, recently completed his internship at the Wisconsin General Hospital, Madison, Wis., and has located at Durham, N. C.

Dr. and Mrs. Herbert W. Lewis

And daughter, Mildred, spent their vacation on a motor trip through the mountains of southwestern Virginia, Tennessee and North Carolina, stopping for visits with relatives and friends at several places.

Resigns From Health Work.

Dr. Charles Hall Farmer, after a year's service as assistant director of the Southside Health unit, recently tendered his resignation. He has returned to Macon, Ga., where he will engage in private practice.

For Sale—

Office furniture and instruments for eye, ear, nose and throat work, account death. Address Mrs. M. R. Irby, 200 West Grace Street, Richmond, Va. (*Adv.*)

Obituary Record

Dr. Levi Johnson Stump,

Pocahontas, Va., died at his home in that place, August 31st, death being due to myocarditis. He was born at Valley, W. Va., in November, 1859, and studied medicine at the Medical College of Virginia, graduating from that institution in 1882. He is survived by one son, Dr. C. E. Stump, of Pocahontas, and a sister. He had been a member of the Medical Society of Virginia for a number of years and was a Mason, Shriner and Elk.

Dr. Charles Fenton Russell,

Herndon, Va., perhaps the oldest physician in this State, died July 16th, after a few days' illness. He was 92 years of age and a graduate of the University of Maryland in the class of 1867. He enlisted for service in the Civil War while a student at the University of Virginia and served in the cavalry, being injured three times. One son, two daughters and a number of grandchildren survive him. Dr. Russell had been a resident of Herndon for nearly forty years. He was an honorary member of the Herndon Masonic Lodge, and belonged to several other fraternal organizations. He was a member and ex-president of the Fairfax County Medical Society and a member of the Medical Society of Virginia.

Dr. Wiliam Scarff Wiley,

Prominent physician and surgeon of Bristol, Va.-Tenn., died eptember 11th, death being due to tetanus which, it is believed, resulted from an abscessed tooth. He was the son of Dr. and Mrs. George E. Wiley, of Bristol, and 49 years of age. He studied medicine at the Medical College of Virginia and later at the Baltimore (Md.) Medical College, graduating from the last named school in 1905. After spending two years in New York Hospitals, he returned to Bristol where he had since practiced. He served in the Medical Corps of the U. S. Army in the World War. Dr. Wiley was a member of the Medical Society of Virginia and of several fraternal organizations. He is survived by his wife and four children in addition to his parents and one sister.

Dr. Emerson Land,

Virginia Beach, Va., former member of the Medical Society of Virginia, died July 29th, at the age of 70 years. He graduated in medicine from the University of Maryland, Baltimore, in 1886. He was for many years county health officer of Princess Anne and was formerly mayor of Virginia Beach.

Dr. Robert L. McMurran,

Portsmouth, Va., died suddenly June 23rd, death being due to angina pectoris. He was 65 years of age and had received his medical education at Jefferson Medical College, Philadelphia, from which he graduated in 1890.